MUNICIPAL AFFAIRS.

ISSUED AT QUARTERLY INTERVALS.

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MUNICIPAL AFFAIRS.

VOL. IV. SEPTEMBER, 1900. No. 3.

A NEW CHARTER FOR GREATER NEW YORK.

Revision of city charters has been a favorite occupation in most American cities. When anything connected with the city government goes wrong, the first impulse is to tinker the charter. Thus within three years after the initiation of Greater New York, another revision commission is appointed whose efforts, although commendable, promise no more permanent relief than preceding attempts to formulate a municipal system.

It is now time to pause and ask whether the theory upon which many cities have been working is not wrong, whether a charter which requires or leads to constant alteration is not erroneous in principle rather than in detail? Unquestionably, an affirmative answer must be given. But what is to take its place?

A NEW MUNICIPAL SYSTEM.

The main lines to be followed are:

I.—The insertion in the state constitution of all general provisions relating to cities, their organization and powers, concerning which there is little or no difference of opinion, thus removing from the sphere of party politics the fundamental principles of the municipal system.

II.—The separation of the present charter and the innumerable local acts into two parts: a Charter and a Municipal Code.

III.—The Charter should be very brief, leaving to the Code minor matters and the application in detail of the powers granted to the municipal authorities. It should prescribe:

(1)—The boundaries of the city.

(2)—The general form of government, naming the principal

departments, apportioning their powers in general terms, fixing their salaries, etc.—but not descending into details.

(3)—A general statement of the municipal powers conferred, including those provisions which are too experimental for insertion in the constitution and too important to leave exclusively to municipal regulation. Upon the whole, it should provide for far greater freedom of action than at present.

(4)—Method of amendment—as at present—only by general law or local act subject to veto by the mayor and re enactment by the legislature.

IV.—The Municipal Code should consist of:

(1)—Regulations in detail regarding municipal matters, which occupy nine-tenths of the present charter.

(2)—The more important provisions to be found in the various codes, orders, regulations, etc., issued by the various city departments. Regulations which cannot be applied to the city as a whole should be placed in separate sections.

(3)—Provisions as to amendment, which should be as follows: Any change or addition to the code may be made by first having been approved either by the local boards or the council (whatever that body may be called) of the entire city and then submitted to some state board which should have power to approve or reject but not amend. In case the proposed amendments are approved, they become a part of the code. Amendments relating to health matters should go to the state board of health, civil service to the civil service commission, educational to the superintendent of the public instruction, etc., and matters with which no state board is at present concerned should go to a municipal government board to be of similar character to the other boards just mentioned.

V.—In order to carry out these ideas and to establish a charter and code as nearly perfect as possible, a new charter commission should be appointed, or the present one continued, with power to employ a large number of experts and to secure the cooperation of every city department. The charter and code so drawn should be submitted to the legislature and the code, par-

ticularly, enacted without alteration. All constitutional amendments would follow the form provided by the constitution.

VI.—In framing the Charter the following principles should be recognized:

(1)—The mayor's power of removal should be unlimited, all chiefs of departments and important boards being appointed by him. He should have the veto power, but the council should have power to pass any measure over his veto by a two-thirds vote.

(2)—Executive departments should be single-headed, except possibly those of education, taxes and assessments and civil service. The term of office should be unlimited.

(3)—Subordinates in every departments should be chosen by the chief, subject to civil service rules.

(4)—The powers of each department should be fixed in general terms, and within the field so delimited, the head of the department should have entire freedom to apportion the authority and duties.

(5)—The council should be composed of the comptroller, chiefs of a few of the principal departments, and ten or fifteen councilmen elected under a scheme of proportional representation from the city at large.

(6)—The council should have legislative power for the whole city, and ordinances now issued by the various departments should not be considered of any force except as provided in section IV, paragraph (3) above. Most of the powers at present belonging to the board of public improvements, the municipal assembly and the board of estimate and apportionment should be given to the council which, instead of being called the council, might retain the name, "Board of Estimate and Apportionment."

(7)—In each borough, boards or councils should be created having local legislative powers and the authority to provide by means of special assessment for the initial expenditures of all public works that are local in character.

To appreciate fully why these suggestions are believed to offer the best solution of our present difficulties, as far as governmental

forms can do so, it is necessary first to understand what defects in present municipal system should be corrected, what errors are to be remedied.

The most important is the method whereby the laws governing the city of New York are amended, for unless some definite change is made, charter revision will continue to be a spasmodic fad, diverting attention from other and more vital questions.

The first thing to be considered is, therefore, the relation of the state legislature to the city.

SPECIAL LEGISLATION—ITS EVILS.

The present situation is well known. The city of New York is governed from the state capitol. Scores of laws are passed every year relating to matters of purely local interest and of minor importance. A bill for a park, in a densely populated portion of the city, is introduced at Albany and perhaps passed with little regard as to whether the city or the people of the locality desire its enactment. If an applicant for a position upon the police force is an inch shorter than the requirements demand, he tries to secure a special act of the legislature authorizing or compelling the police department to appoint him. Or if some charitable organization wishes to be exempted from the water rate, it also proceeds to Albany; and so on *ad infinitum*.

This mass of legislation which flows into Albany from every portion of Greater New York and from every other city, overburdens the state legislature. If every bill of local interest were thoroughly considered, nothing else could be accomplished, and the interests of the state would be neglected. As it is, the less important bills are either not considered at all, or are enacted because no one takes the trouble to oppose them, and because the senator or assemblyman from the district affected is especially persistent. The temptation is very strong for members of the legislature, being perhaps more interested in their own local bills than in the measures affecting the entire state, to push the former to the exclusion of the latter. Every legislator recognizes this fact and invariably expresses the opinion that he would be glad to see some method invented whereby this large amount of local legislation could be done away with entirely or reduced to a minimum. But as long as legislatures deal with local matters, each must see that his bills are passed in order to secure the support of his constituency.

However greatly opposed by members of the legislature and however injurious to the state, it is even more vigorously condemned by and more injurious to the city. Local bills, instead of being acted upon in accordance with the desires of the locality, are often made the football of state politics. Important acts are passed without consulting the city or the authorities affected, and in order to be protected, every interest or person likely to be affected must carefully watch the legislature for fear that without due notice and in some unexpected way, irreparable injury will be done.

CAUSES AND REMEDIES.

This tendency to disregard local interests and to enact laws without careful examination is not the fault of the men that are elected but of the system which permits such methods to exist. The "country members" are no worse, and perhaps somewhat better, than the members from Greater New York and other cities, but it is absolutely impossible with the present large amount of special legislation to examine each bill and to enact or reject it upon its merits alone. In the early part of the present century, England had the same system of dealing with local bodies, and the results were precisely similar to those with which we are so familiar. And so long as the charter particularizes with such detail as at present the form of government and the powers of the various authorities, and so long as the only method of amending it is through legislative enactment, appeals will be made to Albany and bills will be introduced to authorize or compel the city authorities to perform certain acts.

This relation of cause and effect between elaborate charters and special legislation is proved by abundant experience. Wherever charters have dealt with municipal affairs in general terms *only*, there one finds almost no special legislation; but where charters have gone into great detail, as in New York, one always finds a plethora of local laws enacted yearly.

This fact suggests a remedy, namely, the inclusion in city charters of only a general statement of the form of government and of the powers conferred. Such a charter would specify whatever the interests of the state at large demanded, and as to which the city should have no voice. While in a measure this would be taking from the state legislature some of its functions, it would be taking away only those from which at present it

desires to free itself and only those which are not of interest to the state at large.

BENEFICIAL RESULTS.

The results of such a system would be, first, to decrease special legislation; second, to give to the state legislature more time to discuss matters of interest to the whole state; and, third, to differentiate responsibility so that disputes could not arise as to whether the state or the city was responsible for misgovernment.

That these results *would* follow is shown by the experience of foreign and American cities. Great Britain, which has universally adopted the idea, annually passes fewer laws regarding municipal matters than are enacted by New York state—only one of our commonwealths. Of the legislative bodies of Continental Europe, not one is so occupied with local matters as the legislature of Ohio, for example. The charter of Chicago occupies but a few pages, and consequently New York state passes scores of laws regarding Greater New York where Illinois passes one for Chicago.

PURPOSE OF THE CODE.

The only possible objection to the substitution of a short charter of a very general character for the present voluminous charter, would be that the city cannot be trusted to exercise such general powers as would be thereby conferred, and that persons dissatisfied with local conditions would immediately appeal to the state legislature and thus again bring upon us the deluge of special legislation from which we are at present trying to escape.

To prevent these results a municipal code is proposed. If originally prepared with the care suggested, it would be as nearly perfect as possible to make it, and would not call within the near future for very important amendments. However, changes undoubtedly would need to be made, and as this became necessary, ordinances would be proposed by the various departments, presented to the local legislative authority and then sent to the appropriate administrative board at Albany, going into force upon being approved.

The advantages of this over the present system are: The proposed amendment would be thoroughly examined into; no action would be taken until all the parties concerned had had ample opportunity to be heard; and the board, being an ad-

ministrative authority, would not be influenced by the considerations which influence the state legislature and would give an impartial and well-considered decision. By this means, there would be provided a simple, easy and safe method of amending the code. And at the same time, the interests of the state would be safeguarded wherever they enter, and a check established upon hasty and ill-advised action by the local authorities. Yet the local authorities would have much more power than they have at present, and the responsibility for conditions would be entirely clear.

This plan may seem somewhat novel, but in substance it has been found to work well in England, which is considered the home of self-government, not to mention Continental cities. It is also known to very many of our states, where boards of health, superintendents of public instruction and boards of charities have existed for some time. The almost universal opinion is that not only has governmental efficiency greatly increased wherever the idea has been adopted, but that the feeling of home rule has grown stronger and state interference weaker. Its adoption is urged, therefore, not only because it will benefit the city, but because it will be of equal benefit to the state, and because it will go a long way towards solving the problem of home rule.

RESPONSIBILITY SHOULD BE CENTRALIZED.

The first important suggestion, regarding the organization of the city government, as provided in the charter and the code, is the centralization of responsibility. In accordance with the political ideas inherited from Europe and the principles followed in the organization of our national government, we have decentralized municipal administration and established various authorities which are almost independent within their own spheres. As a result, the boss has been developed to supply the need for some one person or authority who should have control over these various semi-independent bodies. Now the chief criticism against the boss is that he is an irresponsible personage that cannot be punished for failing to follow the popular will. If he were made responsible, the evils with which we have become so familiar would largely vanish. All do not agree that it would be advisable to center all power, legislative, executive and judicial, in one person or in one authority, but the advisability of centralizing administrative responsibil-

ity is seldom questioned. The new charter, therefore, should give the mayor ample power to appoint and remove at any time the heads of the various departments which in turn should have similar powers over their subordinates, subject, of course, to the best civil service regulations.

Carrying this idea further, the ordinance power which is now in considerable measure exercised by the various departments, should be lodged with the legislative authority, although the different departments would continue to draft ordinances and submit them to the council. The idea of having many departments, each with full power to enact by-laws upon certain subjects, is not only repugnant to sound political theory but does violence to common sense. When these powers have been transferred to the legislative authority as provided for below, there would be little need, except in a very few cases, of having other than single-headed departments. It would be a wise plan, however, in organizing the council to have a committee on each department, whose duty it should be to have accurate knowledge regarding the entire department, so that when questions came before the council for decision, it could give wise advice so far as the department with which it was connected was concerned.

WHAT SHALL BE DONE WITH THE COUNCIL?

In order to carry out such a plan, it would be necessary to establish a local legislative body or what would correspond to the municipal council in other cities. It is suggested, therefore, that the municipal assembly be abolished, that to the board of estimate and apportionment there should be added such a number of elective officers as would make it more popular and less administrative in character. In order, however, to secure the valuable advice and intimate knowledge of municipal affairs that the heads of the principal departments possess, it would be wise to make several of them members of the board, but so few in number that the appointees of the mayor would never have an undue amount of influence. It is suggested that the name, "Board of Estimate and Apportionment," be retained because of the prevalent dissatisfaction with the municipal assembly and the high esteem in which the board of estimate and apportionment has uniformly been held. This, would be a factor of some importance in persuading men of prominence to accept membership.

BOROUGH BOARDS.

In each borough there should be established a small borough board which should have a local ordinance power and the power of ordering local improvements, the expense of which should be borne by special assessment either in the locality or in the entire borough. This is suggested because the density of population varies so greatly from borough to borough that ordinances which are perfectly just and wise for one borough are wholly unnecessary in another; and because improvements that are desired by a locality and for which they are perfectly willing to pay should not be made to wait until the whole city appreciated the necessity and realized the wisdom of authorizing the expenditure.

In providing for the establishment of such boards provision probably should be made for some scheme of proportional representation, so that the minority party would be more fairly represented than at present, where a large number of voters have no representative whatever.

Beyond this, the city should be left to work out its own internal organization, so that whenever it becomes evident that the existing system is inefficient, the proper changes can be made without recourse to the state legislature. It is not to be supposed, however, that perfect municipal government can be secured either under this or under any other form of government unless public opinion is such as to demand that only the highest principles be recognized in municipal administration and that only the most efficient men be placed in office. This is more likely to be attained, however, when responsibility has been centralized and when power has been given the city to remedy conditions it does not approve of, than when it is almost impossible, or at least extremely difficult, for public opinion to make itself felt or when the city is governed from the state capitol.

XUM

RAPID TRANSIT SUBWAYS IN METROPOLITAN CITIES.

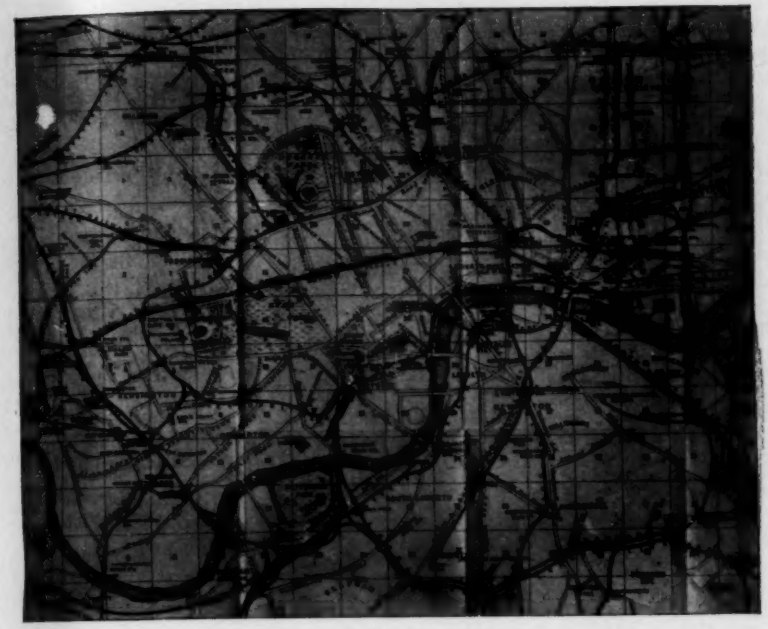
The problem of urban transportation is largely one of rapid communication between business and residential districts, and has grown increasingly difficult as population has become more and more concentrated. Street car companies have tried every conceivable kind of motive power, but they have not been able to keep up with the rapid growth. Steam railroads, which have proved so successful as inter-urban means of communication, have been excluded from most centers because of the noise, smoke and ugliness of the trains. Horse traction is not sufficiently rapid, and the cable for the same reason has given way to electricity.

However satisfactory surface lines may be for short-distance traffic, their inadequacy to deal with suburban traffic became apparent almost half a century ago in the larger urban centers. The steam roads undertook to solve this question by lowering fares and by greatly increasing the number of trains. London went a step further and built underground roads connecting most of the depots in the metropolis. Other cities, such as New York, Chicago, Boston, Liverpool and Berlin, have constructed elevated roads, but these are unsightly, and within the last few years they also have proved or are proving inadequate to deal with the vast throngs who daily leave their homes to seek work in other portions of the cities in which they live. And now, as the last resort, electric subways are proposed, and systems have been or are being built in Paris, Budapest, Glasgow, London, Boston and New York,[1] while other cities are considering the question.

RAPID TRANSIT IN LONDON.

Owing to the enormous cost of constructing underground roads, a large daily traffic is essential to successful operation. This condition appeared first in London. When railroads were

[1] Short sections of Berlin's elevated road are underground, but it has not been included in this article because so small a portion will be below the street level.

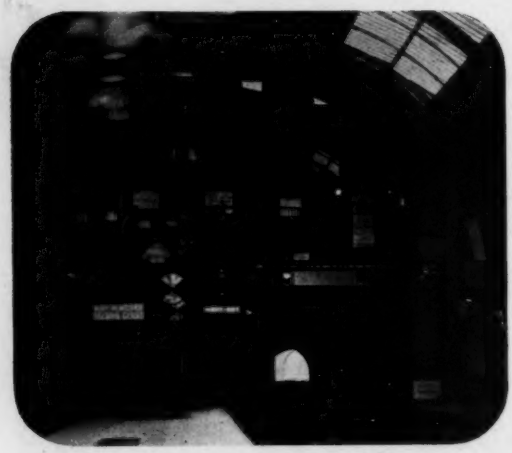


UNDERGROUND ROADS IN LONDON.

invented and their utility generally recognized, London was already a city of considerable size (population in 1851, 2,363,274). Its ancient streets were considered too sacred to be polluted by a noisy monster, and the importance of rapid communication between the central portion of the city and suburban areas was not yet recognized. Thus the first steam railroads were halted at the threshold of the inner city and made to build their terminal stations some distance from the center of commercial activity. With the growth of the city and the giving over of certain portions almost exclusively to business, some means of communication between the numerous depots became necessary. Steam surface roads were out of the question; electricity and cable traction had not been invented; and horse cars were too slow. Underground steam roads seemed the only alternative.

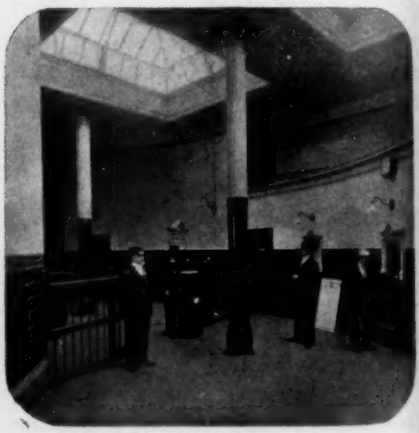
For years the construction of these lines went on, until at present there are 300 miles and upwards of 270 stations within a six-mile radius of Charing Cross. These railways probably

carry over 300,000,000 passengers annually, and including the omnibus, tramway, cab and steamer passengers, the total approaches very nearly 1,000,000,000 persons annually.



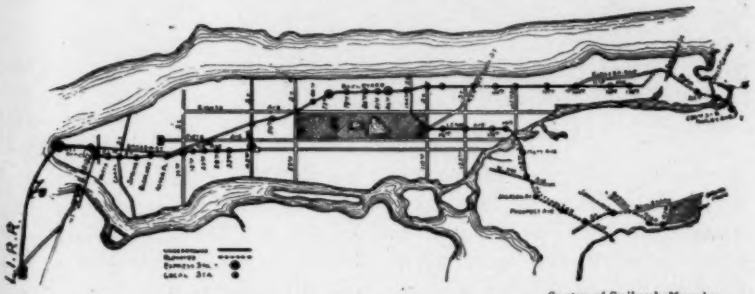
THE STEAM UNDERGROUND, LONDON.

The unpleasant features of travel in the "underground" — the dingy entrances, the dark tunnels, the dirty, crowded and dimly-lighted cars, the sulphurous fumes from the engines, the dirt-laden air— were appreciated from the start and grew worse as the traffic increased. The lines were mostly near the surface, and openings were provided at short intervals to permit the smoke, steam and gas to escape, but they very inadequately performed that function. The managers, with the characteristic English slowness to adopt new methods and the desire to make large profits, reminding one of the New York Manhattan Elevated Railway Company, refused to adopt electric traction, and until 1890 there was no method of rapid transportation in London other than the steam roads.



TICKET OFFICE ON THE CENTRAL LONDON.

In that year, the City and South London Electric Railway was opened, about three and one-half miles in length, extending from near The Monument in King William street, only a few blocks from the commercial center of the metropolis, to the suburban district of Stockwell upon the south side of the Thames. The success of this road and the desire for access to the heart of the city led the South Western Railway—one of the most important English roads—to construct a short electric line between its Waterloo station and the Mansion House, opposite the Bank of England. This line is very short, only one and one-half miles in length, but it does assist in solving the problem of urban transpor-



Courtesy of Scribner's Magazine.

NEW YORK SUBWAY.

tation in that it brings the suburban districts reached by the South Western into closer communication with the business portion of the city.

The Central London Railroad, the latest, largest and best equipped of all London subways, most nearly resembles, from the point of location, the New York subway. It runs from the Bank of England, under Cheapside, Newgate, Holborn Viaduct and Oxford Street, past St. Paul's Cathedral, Hyde Park and Kensington Gardens to a station in the suburban district of Shepherd's Bush, a total distance of six and one-half miles. There is a large traffic towards the Bank of England in the morning and to the West End in the evening, and the only means of transportation until lately was by omnibus or carriage, or a roundabout route via the underground. No tramway has been permitted to occupy this main artery, and the new underground road will greatly add to the transportation facilities of London.

Various other electric underground lines have been proposed, and within the near future, the Metropolitan and the Metropolitan District Railways, now operated by steam, will adopt electricity as a motive power. Bids and plans have already been called for.

BUDAPEST SUBWAY.

CONDITIONS IN BUDAPEST.

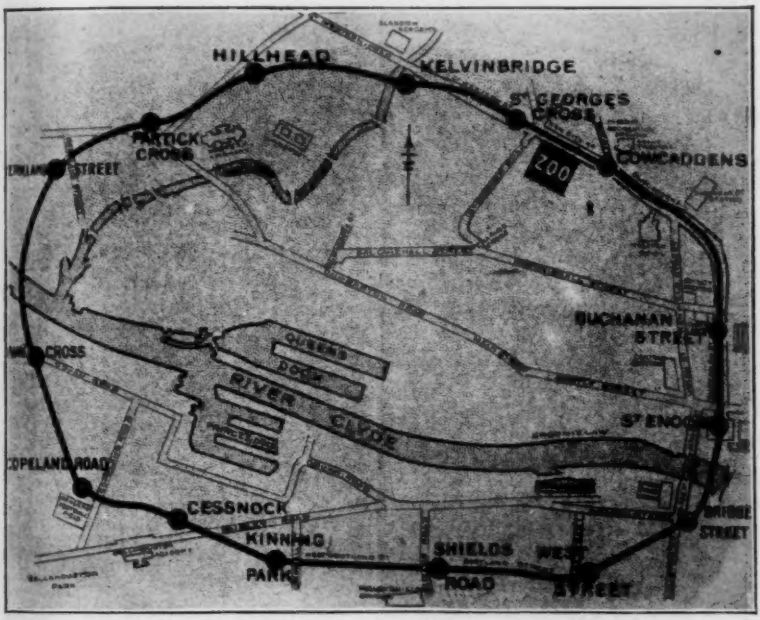
After London, Budapest was the first city to build a subway. Here it was the outcome of various plans for joining the central and business portion of the city with the park, a favorite rendezvous some two and one-half miles distant. Nothing definite was proposed until the spacious and handsome Andrassystrasse was laid out, which offered a direct and attractive route for a street railway. Application was made for permission to build a horse car line, but the plan met with strong opposition, chiefly upon æsthetic grounds. Several years later, after a short experimental electric line had proved a success, the scheme was again resurrected, electricity being the motive power. This proposal met a fate similar to its predecessors and led to the construction of the subway. In 1894 the concession was granted, and two years later

BUDAPEST SUBWAY, ANDRASSYSTRASSE.
(Showing method of construction and location.)

the line was opened to the public. No other project is at present being considered; the transportation problem is not so serious as elsewhere, and the tramway system is very efficient, giving satisfactory service.

THE GLASGOW SUBWAY.

The Glasgow subway was started several years before that in Budapest, but being much larger in scope and more difficult to



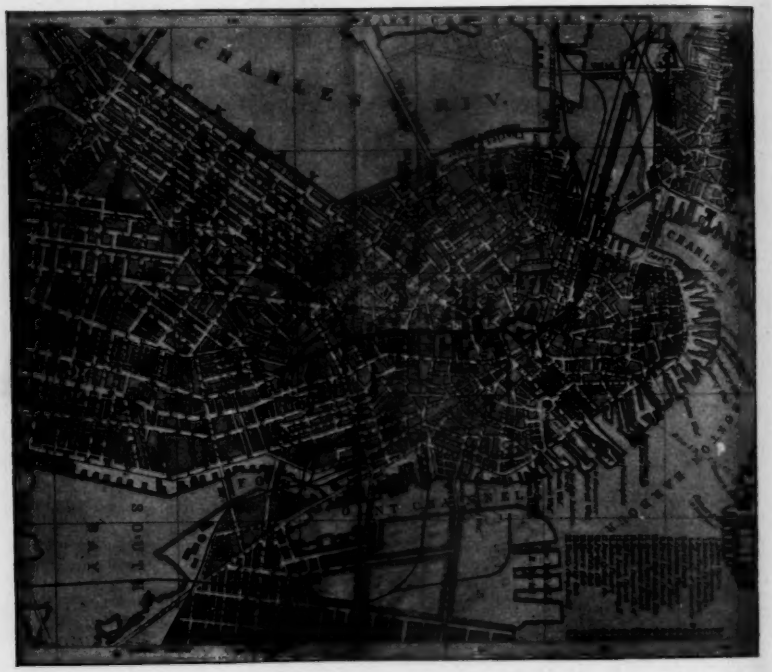
GLASGOW SUBWAY.

(Buchanan Street and St. Enoch stations are near the commercial and business centers. The areas reached by the road to the south-west, the west and north-west are residential quarters.)

construct, owing to the great amount of tunneling necessary, it was not opened until the latter part of 1896. Even then it did not remain open, for the traffic was so much heavier than anticipated that it was necessary to close the line for a few weeks and improve the facilities for handling crowds.

The first definité project for an underground road culminated in 1887, when a bill was introduced into Parliament to authorize

such an undertaking. The local authorities opposed it, because they feared that tunnels under the Clyde would render any further deepening of the river impossible and thus seriously interfere with the commercial development of the city. However, in 1890, a bill was passed; these objections did not seem of sufficient importance to counterbalance the need for rapid transit. Short sections of the steam roads, similiar to those in London, had been



THE BOSTON SUBWAY.

(The subway is indicated by the black line in the central portion of the map. Scollay square is at the western extremity of the island made by the two branches.)

operated for some time below the surface, but they reached only a few suburban districts. The new subway connects the business portions of the city with the residential areas to the west and northwest. Its eastern extremity is in the heart of the city, from whence the line makes a broad swing to the west, some seven miles in circumference.

As yet there seems to be no competition between the subway and the municipal street railways. The latter do not reach many of the suburbs served by the subway, and the long distance traffic does not use the surface lines because they are slower. Even with the proposed extensions, there will be abundant traffic for each system.

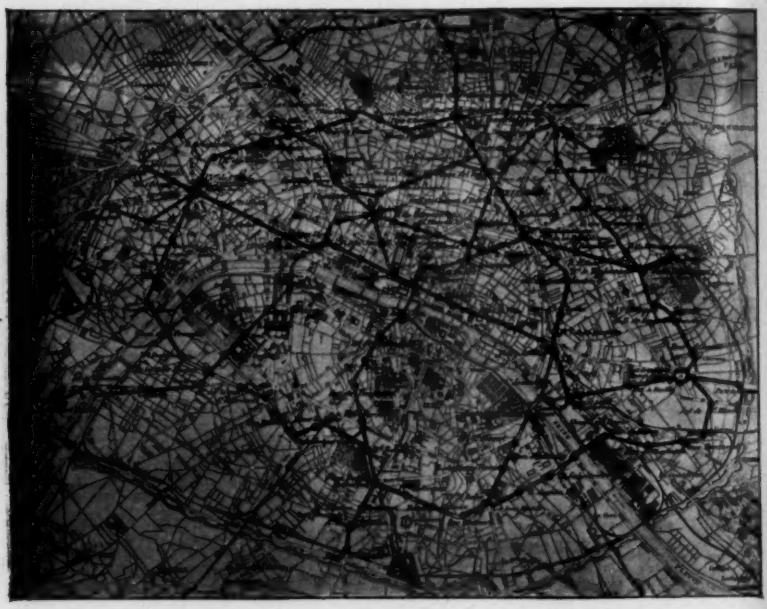
BOSTON'S SUBWAY.

The Boston subway was opened in 1898. It is entirely unlike every other line, not being a separate and distinct system, but merely affording to the surface lines a means of reaching the business districts without using the surface of the streets. Prior to its construction, the street car lines from the many suburban districts around Boston all met on Huntington avenue, Tremont and Boylston streets, or at Scollay square. Between Scollay square and the junction of Tremont and Boylston streets, the congestion was so great that traffic was almost wholly impeded during the busiest hours of the day. Various solutions of the problem were proposed from time to time. An elevated road was rejected by a popular vote, and the proposed widening of the streets involved so great an expense as to be impracticable. The only comprehensive scheme seemed to be a subway in the congested district, and in 1894 an act was passed authorizing its construction. The results have been most satisfactory. The streets are not nearly so crowded as before, and there is a great saving to the passengers of the time necessary to reach the central portion of the city from almost any suburb. The total length of the subway is 1¾ miles and contains over five miles of track. Several additional lines are under consideration.

SCOLLAY SQUARE, BOSTON.
(Congestion of traffic prior to construction of the subway.)

THE COMPREHENSIVE SCHEME FOR PARIS.

The problem of rapid transit was first agitated in Paris almost half a century ago, and as early as 1870 the municipal authorities began seriously to study various solutions. In imitation of other cities, an elevated road was proposed during the eighties, but the æsthetic Parisian would have none of it. The beautiful boulevards, streets and public places, laid out by Baron Haussmann at



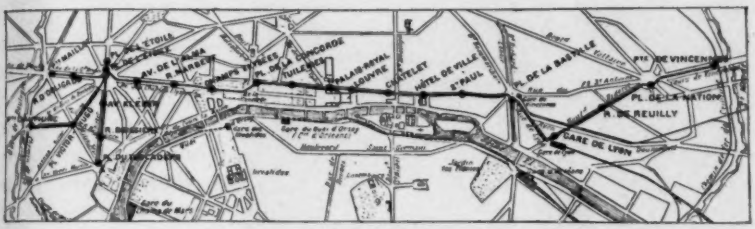
THE PARIS SUBWAYS. *Courtesy of Le Génie Civil.*

(The subways are indicated by the dark lines. The map includes not only the portions already constructed but all approved by the central government.

great expense, must be preserved at every cost. And true to French custom no plan would be approved until a comprehensive scheme for the whole city was formulated. This had been accomplished by 1896, an electric subway having been decided upon. The street traffic had become so congested that no more surface lines or omnibus routes could be added.

The extent of the Paris metropolitan subway is indicated by the above map. When it is entirely completed, the system

will be nearly forty and one-half miles in length, will cost the city $36,000,000, and the operating company about $10,000,000 more for equipment.[1] At present, only one section and parts of two others have been completely constructed and put in operation, namely, the line running from the Vincennes gate in the east, past the Hôtel de Ville, the Louvre and the Tuileries, down the Champs Elysées to the Place de L'Etoile from which three lines radiate: one to the Trocadero, one to Porte Dauphine and one to Porte Maillot. The total length is some eight miles, and the cost about $7,000,000 for construction alone.



PORTION OF PARIS SUBWAY NOW IN OPERATION.

PUBLIC CONTROL IN GREAT BRITAIN.

The relation of the municipality to the subways varies greatly from city to city. In no instance have the city authorities undertaken operation; but in Paris and Boston, as in New York, the public owns the subway, having constructed it at public expense.

The extent of public control is least in Great Britain, there being a marked difference between street railways—surface lines—and underground roads. The former are subject to strict control, and the municipality may take over a line twenty-one years from the time when the franchise is granted, or may construct or purchase the tracks and rent them to a private company. But no underground road is municipally owned or operated, and no public authority has the right under the act granting the franchise to purchase a line. Of course the local authorities may regulate to a moderate degree, but beyond a somewhat restricted exercise of the police powers, they may not go. The most important provision

[1] The city has planned for two more sections, making eight in all, bringing the total length up to 48.5 miles and the cost up to between $45,000,000 and $50,000,000. These last two sections have not yet been authorized by the central government.

XUM

found in any of the acts, except clauses protecting avowedly private interests, such as are to be found in acts creating steam railroads using private property principally,[1] is one requiring workmen's trains to be run each day morning and evening at a fare not to exceed two cents for the whole or any part of the journey on the Central London Railway. Of course Parliament knows no higher law than its own will and may impose any restrictions or may order compulsory purchase at any price, but all such proceedings are without the realm of probability.

STATION ENTRANCE AT SCOLLAY SQUARE.

(This view shows not only how the streets have been cleared, but also the artistic character of the stations.)

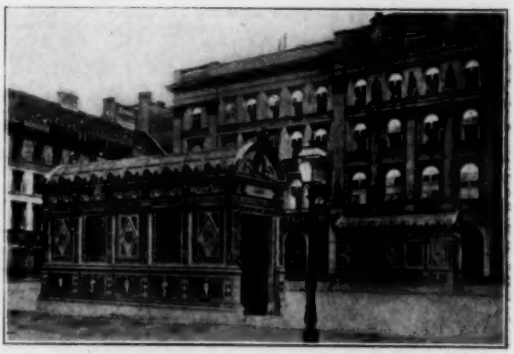
This difference between underground and tramway lines rather surprises one at first, for British cities have gone as far in the direction of municipal socialism as those of almost any other country. The explanation is a very important fact, viz., that municipalization in Great Britain is not so much an economic movement as the expression of the desire that the local governments keep control of the streets. The underground roads, in so far as they cross or pass under the streets and public places, are using public

[1] The restrictions imposed upon private companies relate principally to the amount of capital that may be issued, the extent to which loans may be negotiated, location of the road, the property purchased, the indemnities paid, the maximum fares charged, the number of trains run, the motive power used, etc., etc.

property, to which the public authorities have as clear a title as that of a private individual to the ground under his house.

BUDAPEST SUBWAY STATIONS, NEAR THE PARK.

The law knows no limit either above or below the surface. Yet no demand has been made upon the underground lines for payment or for the reservation of the right to take over the line. It is to be borne in mind, however, that the underground roads, especially those constructed since the movement for municipalization became strong, are some distance below the surface,[1] that their construction and operation necessitates very little disturbance of the street surface, and that instead of increasing the traffic, they relieve it. Further, they do not promise to be exceedingly remunerative, and without public aid either through subsidies or free grants to use the ground below the surface of the streets, many of them would not have been built. Both London and Glasgow have recognized these facts and have



GISELLAPLATZ STATIONS, BUDAPEST.

[1] The average depth of the Glasgow subway is 29 feet and the Central London Railway is everywhere, except at the western terminus which is on private property, at least 30 feet below the surface of the streets. Only the Metropolitan and the Metropolitan District Company are near the surface and have open subways. These are the steam roads which got their powers years ago.

not opposed the companies when they have appealed to Parliament for power to use the ground below the streets.

FRANCHISE IN BUDAPEST.

The nearest approach to British conditions is to be found in Budapest. There the city has invested nothing; the subway has been built, equipped and operated by a private company. But the city has reserved the privilege of taking over the line in 1940 when the concessions for the surface lines expire, provided announcement is made of its intention two years previous. Otherwise the franchise runs ninety years from 1896 or until 1986. The maximum fare is fixed at ten kreutzers (5 cents) during the first fifteen years, after which the city authorities may require a reduction. The city will receive from the gross revenues an amount to be calculated on the following scale:

During the first	10	years	following a period of	20	years,	1916–26	1%
"	second	"	"	"	"	"	1926–36	2%
"	third	"	"	"	"	"	1936–46	3%
"	fourth	"	"	"	"	"	1946–56	4%

from this time to the end of the concession, 1956–1986, 5%. During the first twenty-five years, the city cannot grant any other concession for the establishment of a system of transportation of any kind between the center of the city and the Park. And for the first fifteen years, the company is exempt from taxation. The city of course possesses in addition the usual police powers, and the concession contains many provisions specifying how the subway was to be built and how it is to be operated.

TERMS OF THE PARIS CONCESSION.

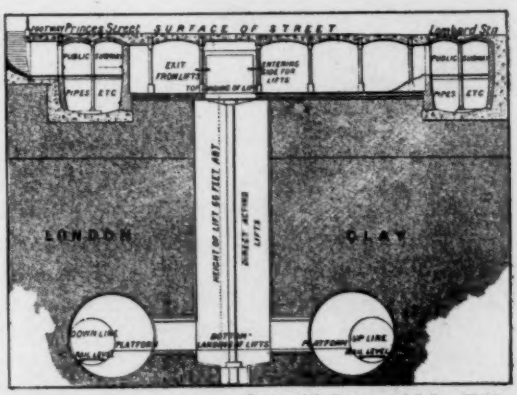
The position of the Paris subway is the result of many compromises between the municipal council and the central government, whose approval was necessary for the execution of the project. The central authorities insisted that the subway be connected with the railroads in order that trains from the country might be run right through to the center of the city and a suburban traffic thus developed. The municipality feared that the railroad companies would get control of the subway and that a large portion of the population would be induced to leave the city and live in the suburbs, thereby decreasing the city's revenue from octroi. A compromise was finally effected, and in the early

part of 1898 the act was passed, which fixed the gauge of the road, over which there had been so much dispute, at the standard width. But the city in order to prevent the railroads from ever sending their cars over the subway, has built the tunnels so narrow that only those cars can be used that are especially constructed for the subway.

Courtesy of the Tramway and Railway World.

EXTERIOR OF STATION ON THE CENTRAL LONDON ROAD.

Another point upon which the municipal council and the central government did not agree was as to who should operate the lines. The council wished not only to own but to operate the road. The central authorities objected, but finally compromised upon municipal ownership and private operation. This plan offers many advantages. According to a general law passed in 1842, a private company gets a franchise for seventy-five years if it builds a railroad; but if a public authority constructs a line, it may shorten the period to thirty-five years. Further, under private ownership, a company would find considerable difficulty in raising sufficient capital to build and operate the whole system.

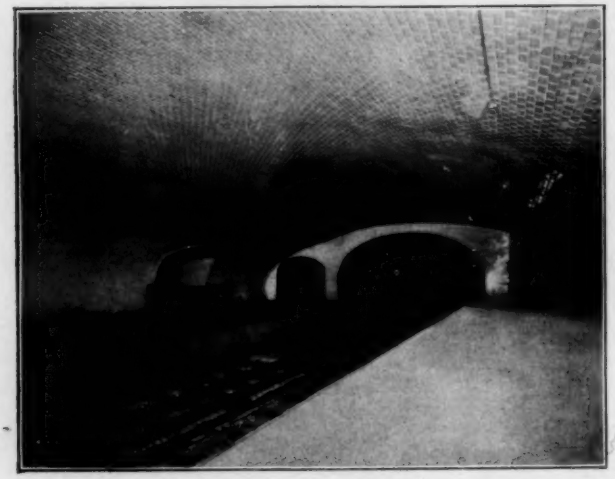


Courtesy of the Tramway and Railway World.

LOCATION OF ROAD AT THE BANK OF ENGLAND.

Paris could borrow the money easily, and not only easily but at a lower rate of interest than a private company. This saving would be no small factor and will enable the road to lower fares ultimately.

The contract between the municipality and the operating company is most interesting. The franchise runs for thirty-five years, but at any time within seven years from date of construction the city may acquire the lines. The company agrees to maintain the highest degree of efficiency, to give to its employees an annual vacation of ten days with full salary, to give them full pay during military instruction and sickness, to insure them against accident, and to pay to the city two cents for every first-class ticket and one cent for every second-class ticket sold, with the added provision that when the annual passenger traffic exceeds 140,000,000 persons, this sum shall be increased, reaching at the highest figure 2.1 cents for each first-class and 1.1 cents for each second-class ticket. As the concession fixes the rate for a first-class ticket at five cents and for a second-class ticket at three cents, and for school children with teacher at a uniform rate of one cent, about one-third of the entire receipts will go to the municipality and two-thirds to the company. As the cost will be about $35,000,000 for the lines thus far authorized, an annual revenue of $1,100,000 will be necessary to pay the interest, sinking fund charges and



Courtesy of the Street Railway Journal.

PARIS SUBWAY STATION.

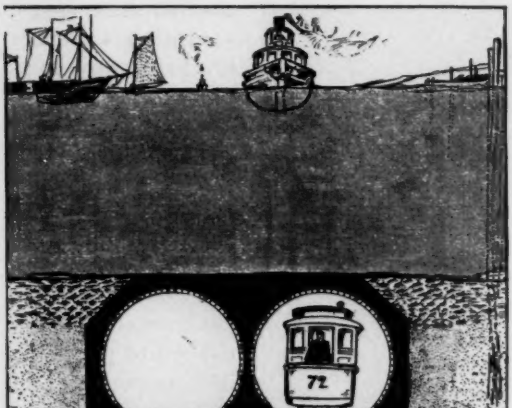
PARK STREET STATION, BOSTON.

incidental expenses; operating expenses are paid by the company leasing the subway. Thus, if the entire system should carry only 125,000,000 passengers annually, the city would more than pay all expenses. As this is considered to be a very low estimate and as it seems almost certain that the traffic will far exceed this number, the city will probably find the subway a paying investment. The roads in London, Berlin and New York carry nearly 5,000,000 passengers per mile per year; the Paris subway ought easily to reach the necessary 3,000,000 per mile per year.

The entire system of subways is not to be constructed at once, but is divided into six sections (two more have not been approved by the central government), which are to be opened from time to time as specified in the act, until by 1916 every line will be in operation. All are to bk
present leasing company and upon

Courtesy of the Tramway and Railway World.

STATION ON CENTRAL LONDON RAILWAY.

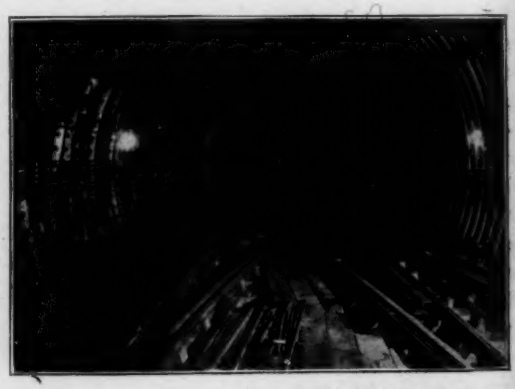


PROPOSED SUBWAY UNDER EAST RIVER TO BROOKLYN.

the same terms as given above. The thirty-five year period—the duration of the franchise—is to run from the date of opening each line, and to prevent any inconvenience which might arise from franchises for different sections falling in at different dates, the concession provides that the company may retain possession of all until the termination of the last franchise, and shall pay 45,000 francs per kilometer per year ($14,000 per mile) for every line whose lease expires previous to that time.

CONDITIONS IN BOSTON LEASE.

Like Paris, Boston owns its subway, and has rented it for twenty years to a private company—the West End Elevated Railway Company, which has sub-leased it to the Boston Elevated Railway Company. The rental will never be less than four and seven-eights per cent of the cost of the subway, and if this sum does not amount to five



Courtesy of the Electrical World and Engineer.

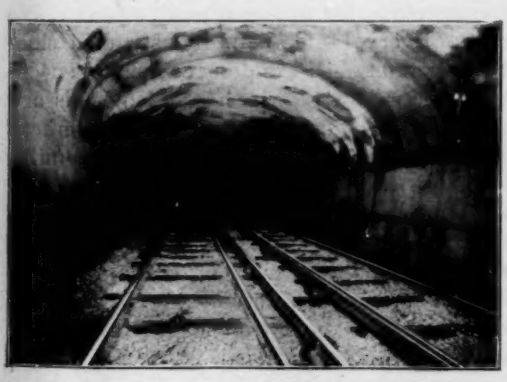
CENTRAL LONDON TUNNEL.

cents for each car using the subway, it shall be made up to this sum. The income will pay the interest on all outstanding bonds and provide a sinking fund to extinguish them at maturity—forty years hence. All operating expenses are paid by the operating company, and at the expiration of the lease, the city will pay the fair value of all rails, pipes, wires, etc., which are affixed to the subway.

BOSTON SUBWAY.
(Showing method of avoiding grade crossings.)

COMPENSATION.

Comparing the various methods of securing compensation, it is evident that in no instance have large profits been secured. Budapest undoubtedly receives the most, considering the fact that it has invested nothing, for even the expense of rearranging sewers, water mains, conduits, etc., was borne by the subway company. Paris may make the most, for if the traffic greatly exceeds 125,000,000 persons annually, the *net* profit will be more than five per



Courtesy of the Street Railway Journal.
PARIS SUBWAY TUNNEL.

cent of the gross receipts, as the rate is about thirty-three per cent of the gross receipts. However, if the traffic should fall considerably below this figure, the municipality will need to make up the deficit from other sources. There seems to be little risk in this direction, and Paris has followed its usual course of exacting large payments from municipal monopolies rather than of requiring lower prices and increasingly better service. London and Glasgow are at the other extreme, and New York and Boston are not far distant, for the payments are not large, barely exceeding for the present the interest on bonds issued for the construction of the subways and sinking fund charges to wipe out the debt.

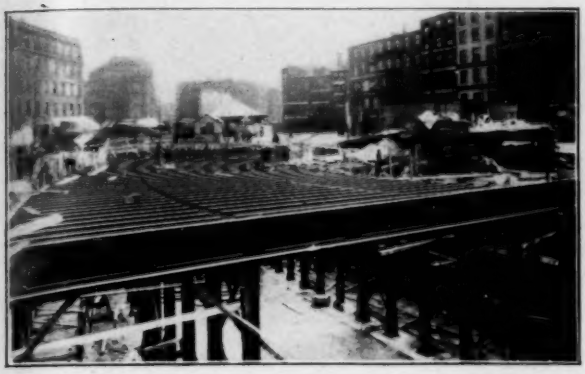
Considerable variety exists also as to the basis for compensation. Budapest uses gross receipts—an easily ascertainable basis and freed from much adverse criticism by the requirement that the rate increase as the years pass, or in other words, as the road becomes more remunerative. Paris has adopted an even simpler basis, receiving a certain fixed sum for each ticket sold. An attempt has also been made to vary the amount with the traffic but not quite so successfully as in Budapest. In Boston and New York, the cost of construction is used as a basis, and the payment to the city is a fixed sum no matter what the profit or the loss to the private company, or the size of the traffic.

MOTIVE POWERS.

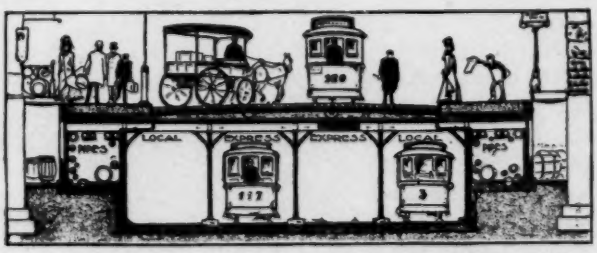
An examination of the roads themselves revels a great difference between those recently constructed and the underground lines in London built many years ago. Steam, as a motive power, has given way to electricity. Every London line constructed since 1890—the date when the City and South London road was opened—has adopted the third-rail electric system, as have also Paris and New York. The Budapest and Boston subways use the overhead trolley. Glasgow clings to cable traction which is largely accounted for by the conservatism of the Scotch and the fact that in 1890, when work was begun on the subway, electricity had not yet clearly demonstrated its efficiency. Cable traction was much cheaper, and upon the steep grades the car going down will help to pull up the car going in the opposite direction. The act of Parliament imposes no conditions except that steam can not be used. The Glasgow subway is unique in that it is the only underground cable railway for passengers in the world. Thus far it has worked very well.

TRAVEL A PLEASURE.

All the modern subways, even that of Glasgow, have adopted electric lighting, and the cars and tunnels are in marked contrast to those of the steam lines in London, which are dimly lighted, dirty and forbidding. Glazed tiles have generally been used, especially at the stations, and in every way the comfort and pleasure of the passengers have been ministered to. The entrances in Boston and Budapest particularly, are very artistic, and instead of being repellant because of their dirt and ugliness even add to the beauty of the streets and public places in which they are located. The London electric lines, being situated many feet below the level of the streets, have provided spacious elevators which counteract the disadvantages of deep level travel. The Paris, Budapest and Boston subways do not need them, being located near the surface of the streets. The Glasgow company has one, in Kelvinbridge, where the road is 115 feet below the crest of the hill, and New York will have a few where the road is far below the surface.



BOSTON SUBWAY.
(Showing method of construction.)



CROSS SECTION OF NEW YORK SUBWAY IN ELM STREET.

In the construction of the subways, much the same plans have been followed everywhere. Where the road level is near the street level, an open ditch was made, steel framework inserted and the street pavement replaced. Where this was impracticable, tunnels were driven; and in a few instances short viaducts were erected. The Budapest subway is everywhere just below the street level, and consists of two parallel lines at the same level, separated only by steel pillars, station platforms or thin walls. The Paris subway likewise consists of two parallel lines and always at the same level except where one section crosses another and a dip is made to avoid crossing at grade. Some of the distance, the lines run side by side, in a single tunnel; in other portions each line has a separate tunnel, uniting only at stations. The Glasgow road consists of two distinct tunnels throughout, except at stations, as is true of nearly all the London electric lines except the Waterloo and City road which has only one line almost all the way. The Boston subway has from two to four lines, usually at the same level, except where it is necessary to raise or lower one to avoid grade crossings. The New York line is the only one that has tracks for the special purpose of

Courtesy of the Electrical World and Engineer.

CENTRAL LONDON TRAIN.

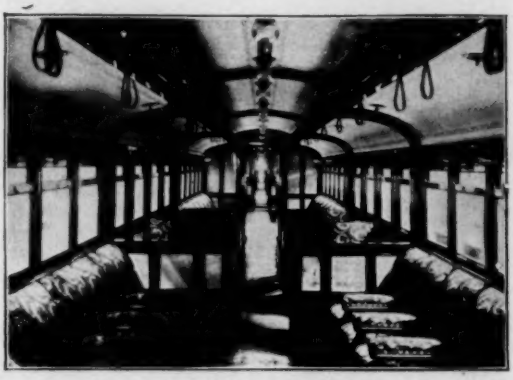
GLASGOW SUBWAY—STATION AND TRAIN.

running express trains; and with the Central London road is unique in raising its stations above the level of the road. Each train on its departure thus is accelerated by the force of gravity, and as it approaches, is checked by the same force. This will greatly increase the rate of speed by reducing the time required for stopping and starting.

Courtesy of La Genie Civil.

CARS USED IN PARIS SUBWAY.

Most of the modern subways are adopting the American style of car, with an entrance at each end, in place of the old style compartment coach. Even the London roads are making the change and the Glasgow line introduced them at the start. The Paris car is a hybrid, having two doors on each side, one set being used for entrance and the other for exit. The train idea seems also to be spreading, as being more economical and better adapted to handling large crowds.



Courtesy of the Electrical World and Engineer.

CENTRAL LONDON CAR—MODERN EQUIPMENT.

There is one marked difference between foreign and American lines. Most of the former have first- and second-class compartments or cars; the latter charge the same fare for everyone. The Glasgow subway maintains only one service,

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and the tendency elsewhere is in this direction. Some London roads have already made the change.

The uniform fare regardless of distance is also more common with us than abroad. In Paris and Budapest it is in vogue, but the lines are so short as to render a graded system unnecessary. The Glasgow company intended to adopt it, but as the cars run continuously around the circle, one would be able to ride indefinitely for one fare. To prevent this, a zone system was adopted. A penny ticket (2 cents) allows one to go as far as the fourth station from where he enters the car, or about one- and one-half miles—one-fourth the circumference of the road. A two-penny ticket (4 cents) entitles one to travel any distance, but not more than once around the circle. A ticket is given each passenger, which he gives up upon leaving the station at his destination. Any one who has ridden farther than his ticket indicates is thus found out and required to pay.

Courtesy of the Tramway and Railway World.
GLASGOW SUBWAY CAR.

That the subways of London, Paris, Budapest, Glasgow and Boston were needed and are performing a useful social service is shown by the large number of passengers carried. Their influence can only partially be estimated, but undoubtedly the effect upon social conditions, especially housing and overcrowding, is considerable, not to mention the saving of time in going to and from work. Doubtless rapid transit will not solve either the housing problem or transform our cities into utopias, but it will alleviate social conditions and prevent what otherwise would be unbearable evils.

LONDON GOVERNMENT REORGANIZED:

By Percy W. L. Ashley.

The London Government Act of 1899, which comes into force in November of the present year, is the most recent effort made for the reorganization of London administration. To understand its position in this movement and its actual value, a brief survey of the administrative history of London is necessary.

ADMINISTRATIVE CHOAS.

The Municipal Corporations Act of 1835, which organized the present municipal system of England, did not touch London, and no attempt was made to deal with the government of the metropolis before 1855. At that date the condition of affairs was most chaotic. In the centre was the area of the City of London—about one square mile in extent—with its Lord Mayor and Corporation, and a form of government which had scarcely changed during four hundred years. Outside this was a broad belt of districts which had grown up with little regard for one another, and in which the different administrative bodies had been created (generally by a special act of Parliament) at various times, as need arose. These were based on no general principle, and had induced a state of the utmost administrative chaos.

ATTEMPTS AT REORGANIZATION.

The work of reform began with the Metropolis Management Act of 1855. This act practically formed the Metropolis for the first time, defining it as the area contained by the City of London and a certain number of parishes, specified in the act. The city was untouched; the parishes were divided into two classes. The ratepayers of each parish elected a vestry, of which the membership varied in number. In the first class of parishes, this vestry had power to deal with roads, lighting, sanitation, etc. The vestries of the second class were grouped into fifteen districts, each

administered by a board elected by the vestries of the district. At the head of the whole system was placed the Metropolitan Board of Works, elected by the vestries and district boards, and not directly by the ratepayers. It had control of main drainage, street improvements, etc., and later of parks, bridges, fire-brigades and similar matters, and received powers as to artisans' dwellings. Some changes of detail were subsequently made, but none of any importance before 1888. By that time the board of works, although it had unquestionably rendered very valuable service to London and had carried out many important improvements, had fallen into discredit. Its constitution was unpopular, and shortly before 1888 an exhaustive inquiry had revealed considerable corruption, if not among members, certainly among officials. The Local Government Act of 1888, abolished the board, and transferred its powers to a new central authority, the London County Council, invested with far wider functions, and directly elected by the ratepayers (taxpayers).

In the subordinate authorities meanwhile, few changes had been made, and there was the greatest confusion, chiefly owing to the extent to which the system of so-called "*ad hoc*" bodies (*i. e.*, bodies existent for one sole function) had been carried. Thus there were the vestries and district boards, which dealt with the maintenance, watering and lighting of streets, the enforcement of the acts concerning public health and the adulteration of food and drugs. They might establish baths and libraries, but in that case they handed over the control to special commissioners. The assessment and collection of rates (taxes), and the preparation of juror and voting lists were duties belonging to other authorities called variously overseers, governors, or directors of the poor. The poor laws throughout London were administered by thirty boards of guardians, whose areas might include any number of parishes. Finally, there were certain central bodies, besides the county council: the London school board, the metropolitan asylum board, the conservancies of the two rivers, and the commissioners of police, these last being controlled by the Home Office—a department of the central government.

This was the position of affairs until last year (1899). Slight changes had been made in the composition of the vestries and district boards; the ex-officio chairmanship of the rector of the parish had been abolished, the franchise extended, and the vestries

authorized to take to themselves the duties of the commissioners of baths, libraries or burial grounds. But no really organic change had been made, and in 1899, London was administered by some five hundred public authorities, with a total membership of nearly ten thousand. The disadvantages of such a system, the confusion and inevitable lack of uniformity in administration are obvious.

AMALGAMATION OF LOCAL AUTHORITIES.

The new act is the result of a general movement in favor of reform. The vestries were unsatisfactory, some new grouping seemed essential. The real question at issue was as to the size and functions of these new groups. It was possible to set up a small number of powerful municipalities, which would have given London something of the administrative aspect of Berlin, and thereby to reduce the authority of the county council; or it was possible to extend the authority of the council, and make the vestries, or local councils, the agents of the council, so making London into something like the municipality of Paris. The act, however, has taken a middle course. Its authors were at first suspected of hostility to the county council, whose ten years' work had begun to create something like a municipal feeling in London, and the bill as originally introduced had grave faults. A policy of amendment instead of opposition was, however, finally adopted, and was fully justified by the results obtained.

The new act is a very useful piece of legislation, if only because it clears the way for future reforms, for it is essentially a great measure of simplification. The boards of guardians are to remain untouched, but all the rest of the host of local authorities are swept away, and are replaced by twenty eight municipalities. Of these, fifteen are former parishes; the remainder groups of parishes. The result is of course a great concentration of powers; all the functions of these abolished authorities (overseers, bath and library commissioners, burial boards, etc.), are transferred to the new municipal councils. Each of these will consist of a mayor, a number of aldermen and councillors. The aldermen are never to be more than one-sixth of the number of councillors: councillors and aldermen together are never to number more than seventy. This means of course a great reduction in the number of persons engaged in the government of London (many of the old vestries contained 120 members)—a change which

should be beneficial, as it will allow for an elaborate weeding-out process amongst the present administrators, should the electors care to use the opportunity. The aldermen are to be elected by the council itself (from within or without the council), and for six years. Partial renewal of the councillors every year, or total renewal every third year, is optional; probably the latter alternative will be chosen by most councils, following the example recently set by the boards of guardians. One change in composition, as compared with the old vestries, is that women are no longer eligible for election.

FUNCTIONS OF THE NEW COUNCILS.

The powers of the new councils have already been suggested. They will have all the work of the various authorities which they replace, together with a few not very important powers transferred from the county council.

Other transfers of power, from or to the county council, may be made by agreement between that body and a majority of the municipal councils, subject to the approval of the Local Government Board. The new councils will also have power to promote bills in Parliament, and to oppose them before parliamentary committees. England has not yet reached the stage of administrative development where the approval of a superior local authority is *alone* required, and where a considerable portion of the time of Parliament is not taken up by innumerable local acts.[1]

In matters of finance the new councils, like the old vestries, will have to go to the county council for authority to raise loans, and probably will continue to borrow the money from the council. One useful change is the abolition of elected auditors, and their replacement by the official auditors of the local government board.

In spite of the grouping of parishes, the areas and populations of the new muncipalities will still vary greatly. They range from 9,000 acres (Wandsworth) to 400 (Holborn), from 336,000 inhabitants (Islington) to 50,000 (Stoke Newington). The most important will certainly be Westminster, which with an area including so many important royal and government buildings, a population of nearly 200,000, and rateable value of nearly £5,000,000, will be

[1 The American reader must not misinterpret this sentence. Parliament does devote considerable time to local acts, but as compared with nearly every American State, it may be said to enact very, very little special legislation.—Editor.]

a dangerous rival in dignity to the old City of London, with which it can vie also in historical traditions.

MERITS AND DEMERITS.

Such briefly is the general effect of the new act. Its great merit and importance is that it much simplifies matters, reduces the number of local authorities and administrators, and concentrates power. In this it has followed the general trend of local government upon the Continent, *i. e.*, the abolition of "*ad hoc*" bodies, or their continued existence only as closely controlled agents of the municipal council. It is to be regretted that this concentration was not carried further. The administration of the poor-law should be either carried on by the municipal council itself, or, if still left to a special body, supervised and controlled by the council. This would only be following the example of the Prussian municipalities, for instance, from which in poor-law matters a good deal can be learned.

Another demerit of the new act is that the control of the local authorities by the county council is not strengthened. The control exists in some measure—in some financial matters, as already mentioned, and in matters connected with sanitation and the housing acts. But as the central authority for the whole of London, the county council should have very full powers to secure uniformity of administration and consistent action in all matters of general importance, and especially in all matters which affect health.

Lastly, the old City of London remains untouched, and still stands apart from the awakening municipal life of the rest of London. If it could be brought into line with the other municipalities, it might still assert its claim, as the senior of them all, to be the traditional representative of London. At present it represents nothing, and remains for some more vigorous ministry to reform.

Much has still to be done to make London the well governed city which it should and can be; but the lesson appears to have been learned at last that very much depends on the machine which is to be employed. The great difficulty in London administration of recent years has been the imperfection of the tools. With the recent improvements in these, we are perhaps justified in expecting more satisfactory results.

WATER SUPPLY OF GREATER NEW YORK.

By M. N. Baker.

The proposal of the Ramapo Water Co.,[1] about a year ago, to furnish New York with an additional water supply of 200,000,000 gallons a day from the Catskill region, delivered at the city line under a vaguely defined pressure, at the rate of $70 per million gallons, has resulted in two magnificent studies and reports on the water supply of Greater New York.[2] Both reports are full of valuable information and suggestions for other cities, as well as the one directly concerned. While each report establishes most completely the inadvisability and folly, to put it mildly, of the proposed contract, from the standpoint of the city, the vast problems involved in securing and maintaining a pure and ample water supply for the largest city in America make these reports of national interest and importance.

The earlier of the two investigations was made by Mr. John R. Freeman, of Providence, R. I., who was engaged for the purpose by Comptroller Bird S. Coler, to whom the city is indebted for having blocked the Ramapo scheme at the outset. The temporary delay thus secured afforded an opportunity for the Merchants' Association of New York to look into the question. This public-spirited body soon decided that the interests of taxpayers and good citizens generally required an exhaustive investigation, not only of the proposed contract, but of the whole water supply question. The Association created a committee of twenty-one voluntary workers, divided into sub-committees on engineering,

[1] The March issue of Municipal Affairs, pp. 88–91, contains an account of the attempt to foist upon the city this most iniquitous contract.

[2] *An Inquiry into the Conditions Relating to the Water Supply of the City of New York*, by The Merchants' Association of New York. 8vo, 627 pp. Tables, diagrams and maps. New York, The Merchants' Association, $3.

Report upon New York's Water Supply with Particular Reference to the need of Procuring Additional Sources and their Probable Cost with Works Constructed under Municipal Ownership, made to Bird S. Coler, Comptroller, by John R. Freeman, Civil Engineer. 8vo, 587 pp. Tables, diagrams and maps.

municipal finance and public policy, legislation, and fire protection and insurance. These committees were provided with engineering, legal and clerical staffs, the engineering committee having some half dozen engineering experts and numerous assistants. Mr. Freeman had an office and a field staff at work for a number of months.

The conclusions stated in each report are appended to this article.

RÉSUMÉ OF CONCLUSIONS.

The two reports agree in condemning the proposed Ramapo contract and in urging the necessity for immediate steps towards securing an additional water supply. They also agree in the conclusion that steps should be taken to cut down the waste of water by the extended use of meters, but neither the committee nor Mr. Freeman consider that waste reduction will afford more than temporary relief. However, Mr. Freeman shows that as a pure question of engineering and business, unmixed with politics or expediency, only a small additional supply is needed, if only the waste were cut down to a proper figure; and Messrs. J. J. R. Croes and Foster Crowell, two of the experts employed by the engineering sub-committee, reach the same general conclusions, but go further than Mr. Freeman as to the possibility of restricting waste. In fact, Mr. Croes believes that the yearly addition of meters until the whole service is covered, and the gradual overhauling of leaky pipes until the underground leakage is greatly reduced, might make the Croton supply ample for old New York until 1950. This hopeful view of the situation is not shared by the engineering sub-committee, nor the general committee of the Merchants' Association. Each report recommends that the proposed new supply be a large one. Mr. Freeman would develop a supply capable of furnishing 150,000,000 gallons a day at the start and at least 500,000,000 gallons ultimately, preferably 750,000,000 gallons. The Merchants' Association committee recommends the Adirondack region, which is capable of furnishing 1,500,000,000 gallons daily. The two reports agree as to the desirability of filtering both the present and new supplies, but while Mr. Freeman suggests filtration for the future, after cutting down waste, the engineering sub-committee has included filtration in all its estimates for a new supply (except the Upper Hudson) and advises the filtration of the present supplies, from surface sources, as early as possible.

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SOURCES OF NEW SUPPLIES.

The greatest diversity in the final conclusions of the reports is in the recommendations as to the source from which the new supply should be drawn. The source of supply choosen by Mr. Freeman is the Housatonic and Ten-Mile rivers, having a combined drainage area of 1,020 square miles and requiring a large storage reservoir and an aqueduct 36 miles long. A daily supply of 350,000,000 gallons, from this source could be developed at a cost of $46,600,000 for construction, and $1,917,000 for annual operating expenses, interest and maintenance (but no sinking fund allowance).[1] This is $15 per million gallons of water supplied. The estimate, however, provides for the filteration of only 150,000,000 of the 350,000,000 gallons per day, in accordance with Mr. Freeman's original plan. No pumping would be required and the water would be delivered at the city limits under a head equivalent to an elevation of 300 feet above the sea.

The Merchants' Association recommends either the Hudson river above Poughkeepsie, or the Upper Hudson, the supply at first to be 250,000,000 gallons in either case, or 100,000,000 gallons a day less than the basis of Mr. Freeman's estimate, just cited. The water from the Hudson at Poughkeepsie would be both pumped and filtered, after which it would flow to the city limits by gravity through an aqueduct 60 miles long, and under a final head of 260 feet. The drainage area available under this plan is 11,800 square miles and the supply is capable of great future extension. The estimated first cost of this scheme (for 250,000,000 gallons a day) is $36,880,000; the annual charges, $2,585,000, or $28.33 per million gallons. The alternative recommended by the committee is the unfiltered Upper Hudson, or Adirondack supply, from a huge reservoir on the Schroon river, having a drainage area of 518 square miles. An aqueduct no less than 203 miles long would be required for this scheme, but it would deliver water by gravity under a head of 310 feet. Its total first cost would be $71,727,000; annual charges, $2,727,000; cost per million gallons, $30.

Either of the two plans of the Merchants' Association, or the one by Mr. Freeman, is capable of extension to yield a much larger supply than named above. Estimates show that for either the

[1] I use here the figures taken from the Merchants' Association Report to render comparisons easy.

Upper or Lower Hudson, the development of 500,000,000 gallons a day would not diminish the unit cost, although increasing the cost of construction to $72,374,000 and $140,155,000, respectively, but 750,000,000 gallons a day could be secured under Mr. Freeman's Housatonic and Ten Mile-River plan for only $52,000,000 gross and $8 per million gallons, or $67,000,000 and $11.86, respectively, if the whole quantity were filtered.

THE RAMAPO CONTRACT A STEAL.

It is interesting to note that the present water-works system of old New York, including the Croton, Bronx and Byram supplies and the whole storage, pumping and distribution systems, had involved a capital outlay of $86,360,000, up to Dec. 31, 1898; and that the general committee of the Merchants' Association places the cost of water for 1898 at $29 per million gallons, delivered to consumers. It also estimates the cost of distribution at $10 per million gallons, leaving $19 as the figure to be compared with the $70 per million gallons proposed by the Ramapo contract. The latter figure, in turn, is also to be compared with the $8 to $30 of the various estimates based on the Freeman and Merchants' Association plans. By a computation which need not be repeated here, the general committee reaches the conclusion that *in the forty years of the proposed Ramapo contract, the city would lose* $195,000,000, as compared with full municipal ownership.

PRESENT WASTE ENORMOUS.

A few words must be devoted to the reasons why the committee rejects Mr. Freeman's plan for a new supply, after admitting its economic superiority to its own. The chief, if not the only reason is the legal and other complications that might arise over interstate water rights if the Housatonic were chosen, that stream having the lower part of its drainage area in Connecticut. Mr. Freeman foresaw these difficulties and allowed for them in his estimates by including what he thought would prove very tempting prices for Connecticut land and water rights. Certainly the low cost of Mr. Freeman's plan, from $8 to $15, according to quantity and other conditions, compared with some $30 for either of the Hudson sources, warrants careful consideration of and a supreme effort to overcome the obstacles in the way of the Housatonic plan, provided an immense new supply is to be

developed. This raises a question as to whether Mr. Freeman has been consistent in turning from the possibilities of waste restriction, so ably brought out in his report, to the development of such monumental new works as he proposes, and whether the engineering sub-committee and the general committee of the Merchants' Association might not have done well to give more credence to the conclusions and recommendations of their engineers, Messrs. Croes and Crowell, on the same subject.

Without going into details, it may be stated that Messrs. Freeman, Croes and Crowell, have each demonstrated most conclusively that fifty per cent or more of the water supply of Greater New York is wasted, utterly without benefit to anyone, and that the waste might be prevented if only every consumer were metered and the underground waste were stopped. Mr. Freeman's own conclusions as to the difference between ideal and actual conditions are best shown by the accompanying table prepared by him to show the amount of water needed, in addition to present supply, in 1910, 1920 and 1930, for the whole city:

Probable Future Daily Requirements for Additional Water Supply of New York under Ideal, Probably Attainable and Present Conditions.

Year.		Total all Boroughs.
1910..	Probable population	4,490,000
	Additional supply required with greatest waste restriction probably attainable. (Meters on one-half the domestic taps underground leak as much as at present.)	127,000,000
	Additional supply needed under present conditions	230,000,000
1920..	Probable population	5,530,000
	Additional supply probably required under ideal conditions of waste restriction	38,000,000
	Additional supply needed under best waste restriction probably attainable	302,000,000
	Additional supply needed under present conditions	503,000,000
1930..	Probable population	5,575,000
	Additional supply probably needed under ideal conditions of waste restriction	92,000,000
	Additional supply needed under best conditions practically obtainable	597,000,000
	Additional supply needed under present conditions	795,000,000

It will be noted that the additional supply of water needed thirty years hence, "under ideal conditions of waste restriction" is 92,000,000 gallons; "under best conditions practically obtainable," 597,000,000 gallons; "present conditions," 795,000,000 gallons. The question is, if it is possible to cut the needed additional supply from 795,000,000 to 597,000,000 gallons a day, may it not be feasible to go nearer the ideal of 92,000,000 gallons a day?

It is true, as Mr. Freeman suggests, that a too great reliance on waste prevention might result in disaster, through too long a postponement of the date for the introduction of a new supply. It is also true, as the engineering committee urges, that the per capita consumption of 103 gallons per day, in Greater New York, is lower than that of any other large American city. But is the fact that New York wastes relatively less than other American cities a valid reason for providing a huge additional supply, in advance of cutting off a portion of the waste, particularly when the waste equals the actual use? No city ever permanently curtailed the waste of water when a large, new supply, designed to meet the wants of the next twenty to forty years, was in full view.

Personally, I am strongly inclined to agree with Mr. Croes in urging that efforts should be concentrated on cutting off the present enormous waste before developing an additional supply, particularly in Manhattan and the Bronx. It is true that the officials of the city seem quite indifferent as to this waste, and that strong opposition to its curtailment through the use of meters would arise in certain interested quarters; but it ought to be pretty well known by this time that any solution of the water problem of Greater New York, founded on mere common sense and sound engineering and financial principles, will not be enthusiastically received and carried out by the present administration, a Ramapo or some other job being much more to its taste. If, then, strong efforts must be made to overcome official inertia before a well-conceived water supply scheme can be put into effect, why not direct every effort towards securing the adoption of the most logical and economical plan, instead of one based largely on expediency and extravagence?

WATER SUPPLIES LIMITED.

Mr. Freeman has made a fine scientific demonstration of the great waste of water in New York, and Messrs. Croes and Crowell have endorsed and supplemented Mr. Freeman's work. This is most valuable, for during the early years of the coming century no municipal problem will be more pressing than that of providing pure and ample water, and no more effective work can be done than the curtailment of waste. Pure water supplies are limited in quantity in the vicinity of large centers of population, and

sooner or later all large American cities will be obliged to resort to artificial means of water purification, as has been the case with most of the leading European cities. It is interesting but depressing to note that large American cities with the highest water consumption and waste are also notable for the very bad quality of their water supply, like Philadelphia and Allegheny, Pa. The former city is at last taking steps to purify its water, but only after years of struggle with promoters of the Ramapo sort, who came near carrying the day. One reason why Philadelphia delayed the securing of pure water so long, and why the promoters came so near getting a long term contract, was the great cost of building works large enough to purify the enormous quantities of water wasted. The per capita waste alone probably equals, if not exceeds, the combined per capita waste and use in Manhattan and the Bronx.[1] Philadelphia has very few water meters in use, and politicians and water company promoters have united in resisting their introduction or any other means of waste prevention. The ex-chief engineer of the water bureau, Mr. John C. Trautwine, Jr., made a vigorous struggle for the introduction of waste prevention before the installation of filtration plants. After showing, without avail, that filtration with no restriction of waste would cost millions of dollars for construction and large sums annually for operation he felt impelled to resign his position rather than be a party to the construction of purification works to treat 200 gallons or more per capita per day, when 100 gallons would include a large allowance for waste.

The application of the experience of Philadelphia to New York is this: If a vigorous fight is not made to keep down waste, the per capita allowance will increase gradually under present conditions, and with leaps and bounds whenever more water and higher pressure are provided, making it harder, year by year, to resist the attempts to put through Ramapo contracts, both because of the increased demands for water and the larger and larger cost of a supply developed and owned by the city. Or, if we assume that there is no danger of New York's losing the full control of the water supply that it has enjoyed for more than half a century, the

[1] The consumption in 1899, as given in the city reports for that year, with a correction for the over-estimated population given out in advance of the last census, was about 225 gallons per capita in Philadelphia, or over 100 gallons a day more than in Manhattan and the Bronx.

less that is done to keep down the waste, the greater will be the problem of furnishing pure water. We have already seen that both Mr. Freeman and the Merchants' Association advise filtration, differing only as to the time when it should be introduced. Evidently, the smaller the total quantity to be supplied, the sooner it will be feasible to filter water drawn from the present sources, without financial difficulty, and the more readily filtration may be applied to water from new sources of supply. Moreover, a combination of waste prevention and filtration has the further and great advantage of making it possible to utilize nearby sources of limited quantity, instead of going far afield to secure huge volumes of water at an expense of scores of millions. The present Long Island supply for Brooklyn, and the Croton supply for Manhattan, might readily be supplemented from adjacent drainage areas, if the waste was properly reduced, so as to suffice for some years to come. Then, when it were found necessary to add more water, the Hudson at Poughkeepsie, one of the two alternative plans recommended by the Merchants' Association, could be drawn upon, comparatively small pumping and filtration units being added from time to time. In this way, the total volume of water required is always kept at the lowest feasible point, at a great saving in capital and maintenance charges, and water of a better quality is provided. The fire pressure, also, is more easily maintained year after year, with moderate rather than heavy drafts for regular consumption.

FINANCIAL ADVANTAGES OF WASTE RESTRICTION.

One of the disadvantages of an additional supply from a remote source, is that it must be on a grand scale to keep the cost per unit down to a reasonable figure, owing to the large capital charges due to long aqueducts or supply mains. While 250,000,000 to 500,000,000 gallons a day may be developed at a relatively low figure per million gallons, it must be remembered: (1) These huge additions to the water supply of a city make it very difficult to continue existing measures for the restriction of waste, to say nothing of imposing new ones; thus a large new supply really hastens the date when still another addition will be needed. (2) Although the cost per unit of water may be low, the gross outlay required to secure hundreds of millions of gallons of water is immense, and swells the city's total indebtedness.

XUM

This raises a point which deserves more attention than it has yet received: The tendency to lose sight of all other municipal functions when the needs of one department or undertaking are being considered. A larger margin between available supply of and actual demand for water is not the only urgent municipal need of Greater New York. Even if the water debt were to be placed entirely outside the debt limit,[1] in accordance with the recommendation of the Merchants' Association, its existence would be considerd by bankers and brokers when bidding on city bonds, to be issued for other purposes. In cities where all indebtedness falls within the debt limit, it is, of course, even more important that the cost of each municipal improvement should be considered in its relation to the needs of other departments.

FILTRATION.

The subject of filtration should not be passed by without a word relating to the present growing tendency among engineers and sanitarions to urge filtration of all water from surface sources, as distinguished from wells and springs, the water from which has been subjected to natural filtration. As most large cities are dependent upon surface water for their supply, this means that in the future we may expect to see filtration the rule, rather than the exception, in America. Both of the reports under consideration are to be commended for being in accord with this sound engineering principle. The need for filtration is due to the increasing density of population and pollution from other sources, which make it increasingly difficult to secure a source of water supply not liable to occasional, if not constant, pollution. Water purification has been put on such a firm scientific basis, and may be carried out at so low a cost, as to leave no valid excuse for using water that is, or may become at any moment, a menace to health; or that is not pleasant to sight, taste and smell. Obviously, if water is to be purified, the source of supply need not be so remote as otherwise, since minor impurities, or even gross ones, if necessary, may be removed by purification. The nearer the source of supply is to the consumer, the less will be the expense for aqueducts. This is one of the advantages of taking water from the Hudson at Poughkeepsie, instead of from the Upper Hudson.

[1] Water bonds may be issued by New York City in excess of the 10 per cent debt limit, but thereafter bonds for no other purpose may be issued until there is a margin.

These two reports deserve hearty commendation as examples of thorough investigation which might be followed with advantage in other cities, either by or in behalf of city officials, like Mr. Freeman's report to Comptroller Coler, or by voluntary public-spirited organizations, like the work of the Merchants' Association. In each investigation, the highest class of expert talent was secured, and the results obtained will be of immense benefit to communities other than New York. Whether New York will profit by the wealth of information placed before it depends almost wholly upon the spirit shown by its citizens. A few of its high officials have grasped the importance and the significance of the water supply problem, and a small group of private citizens have bent their energies to kill one of the most gigantic schemes of municipal robbery ever dreamed of in the history of the world. The public press of the city has been wonderfully unanimous in condemning the scheme, but it needs to be equally persistent in urging that the recommendations of these two reports be put into effect, particularly the recommendation that immediate steps be taken to increase the margin between water supply and demand. However much persons may differ as the means to be employed, there is no question but that New York is in great danger of a water famine; and it should be equally evident to careful observers that most of the city officials seem far more inclined to encourage than to avert such a disaster, unless the danger can be removed by a contract with the Ramapo Water Co., a combination of bad economics, politics and engineering in the interests of private promoters rather than the health and wealth of citizens and taxpayers.

WATER SNAKES IN OTHER CITIES.

Finally, I wish to emphasize the fact that New York is not the only city which has been or now is confronted with a water-works proposition, swollen with extravagance and corruption. Philadelphia was in the toils of a "water snake," as it was called, for many years, and may see it again before the filtration contracts are let, if its good people are not on the alert. Jersey City drank vile water year after year, like Philadelphia, because its officials could see nothing in an honest solution of the water problem and public opinion was too strong to prevent the consummation of the schemes dearest to the hearts of promoters and politicians. Just

now St. Louis is face to face with a proposed contract for a new supply, the actual merits of which I do not propose to characterize further than to say that they are quite at variance with the traditions and past designs of its engineering department. The two main features common to such schemes are: (1) They do not involve a franchise for the distribution and sale of water to private consumers; (2) The proposed works are not designed by the city after careful consideration and then thrown open to public competition among contractors for their construction.

As to (1), it is realized that public sentiment will no longer tolerate full private ownership of water-works in large cities, particularly where municipal ownership has been tried; consequently the proposed contracts are restricted so as not to bring the contractor and private consumer into conflict.

The evils almost certain to be incident to (2) are: (A) The source of supply is selected because of the ease with which its control may be secured by the contractor, rather than its actual fitness for the city's needs; and (B) the absence of competition. In the case of a virtual monopoly in water, such as the Ramapo Co. has sought to build up through purchase of water rights and legislative restrictions thrust upon the city, there is no competition either as to source of supply or for the labor and material entering into the construction of the proposed works. In other words, the Ramapo promoters counted on cornering the available water supply of Greater New York and getting their own price therefor by shutting out all competition, and also figured on having no limitations to their profits on account of construction. The Philadelphia and Jersey City promoters made their calculations on exactly the same basis. It can be seen, therefore, that an honest man might favor the development of a new water supply for a large city under a contract involving the payment of a unit price for all water consumed, but if both honest and wise he would insist that the city prepare the plans and specifications in such a manner that the contract would be thrown open to the widest possible competition. If the bids were to be on only one source of supply, then, generally speaking, the city should secure control of that source through condemnation; if not, it should see to it that the source was not controlled by some water syndicate, for such control shuts out all competition for material and labor, as well as for the water itself.

MR. FREEMAN'S CONCLUSIONS.

BIRD S. COLER, *Comptroller*, PROVIDENCE, March 23, 1900.
Department of Finance,
New York City.

Sir: I have the honor to make the following report in reply to your oral request of August 24, 1899, * * * [Questions investigated.]* * *

CONCLUSIONS—STATED BRIEFLY.

First—Although the consumption will very soon be uncomfortably close to the safe limit, with prudent management and with moderate and practicable restriction of waste, *the Croton Watershed, supplemented as now by the Bronx and Byram watersheds, can furnish a safe and ample supply for the boroughs of Manhattan and the Bronx for five years to come; thus giving a short but adequate time in which to build works for an additional supply.*

Second—If the public is ready to consent to the complete introduction of domestic meters and if the administration will earnestly and skilfully undertake the saving of water-waste in schools and public buildings and will earnestly and skilfully make such investigation of the locality of the present pipe leakage, as is practicable by closing existing gates and measuring the night flow in various sections by simple means without expensive new appliances; and will then diligently seek and mend the worst of these leaks, at a very moderate total expense, then the safe limit of the present supplies could be extended to ten years hence, with present rate of growth.

One year is *a very* brief time for the necessary surveys—and five years an almost impossibly short time for building proper aqueducts and dams.

Third—The preliminary steps should immediately be taken toward the acquisition of an additional supply on a comprehensive scale, capable of supplying 150 million gallons at the start, and ultimately yielding at least 500 million gallons per 24 hours (preferably 750), and surveys, borings and river guagings, with analysis of water samples, by 20 or more field parties, over nearly all the grounds covered in the reconnaissance described in the following appendices, should be begun during the present summer so that construction may be begun, if possible, early in the spring of 1901 or not later than 1902.

While there is ample proof that more than half of the water now delivered by the New York and Brooklyn aqueducts is wasted, the total per capita consumption of water, including waste, in New York and Brooklyn, is to-day smaller than in Boston, Philadelphia, Washington, Buffalo, Albany, Pittsburgh, Chicago, Cleveland, Detroit, Denver, and certain other large American cities, and it appears plain from reasons given later, *that the hope of restricting waste does not justify delay in making sure of an adequate additional supply.*

Fourth—The work of the Water Department in the location and prevention of waste should be reorganized and carried on more skilfully and earnestly than heretofore. The city divided into districts, the statistics of average consumption and night consumption in bulk and per capita obtained and classified. The metered use better classified and the whole statistics published annually in such form that comparisons of economy can be easily and intelligently made.

Fifth—If, from legislative or other causes, there has to be delay in securing a moderate additional supply, then a thorough system of waste-prevention, beginning properly with a meter on every domestic service, *must, of necessity, be begun at once or danger of a water famine invited.*

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Sixth—For the proper and reasonable protection of the entire city against fire and for the greater convenience and economy of the householders I would earnestly recommend that all new work in supply and distribution of water tend toward providing a pressure or head of 300 feet above sea level at the city limits (near Yonkers) for any new supply from the north, and (ultimately) a pressure of 100 pounds to the square inch above street level at the City Hall, and that requirements for plumbing and all pipe laying be carried forward with a view to the gradual increase of pressure toward this limit, reaching it, say, 15 or 20 years hence. Recent experience in Syracuse proves that such a change of pressure is entirely possible without great disturbance or inconvenience.

Seventh—I find the price proposed by the Ramapo Company exorbitant and that this source, while good in some ways, is less desirable, of smaller capacity and more expensive than other sources that can probably be obtained.

REPORT OF THE MERCHANTS' ASSOCIATION COMMITTEE ON WATER SUPPLY.[1]

To the Merchants' Association of New York:

GENTLEMEN: The Committee on Water Supply presents herewith its report.

The proposal of the Board of Public Improvements in August, 1899, to enter into a long-term contract with the Ramapo Water Company to furnish the city with water, called the earnest attention of the public to two important subjects.

First: The City's needs, immediate and future, for an additional supply of water.

Second: The best method of meeting these needs, both as to the sources of the supply and the manner in which it should be procured; that is, whether by private contract or municipal construction.

* * [Organization of Committee.] * *

PART I.

RELATIVE FINANCIAL RESULTS OF MUNICIPAL AND PRIVATE OWNERSHIP.

* * [Financial History of Water Supply.] * *

In other words, during the term of sixty-seven years, from January 1, 1832 to December 31, 1898, the City of New York made a capital investment of $86,359,562.09 for the construction of water works. It expended during that period for interest charges, maintenance and operation $66,544,245.38; the aggregate earnings were $88,017,329.72; the total net profits were $21,473,084.34.

The Committee reaches the following conclusions from the data analyzed:

1. The maximum cost of water per million gallons by the Croton System (obtained by dividing the total annual charge by the quantity delivered) was $54.20 in 1849.

2. The average cost per million gallons from 1866 to 1898, both inclusive, was $35.06. The data of consumption during some of the preceding years are lacking and the average cost cannot be accurately computed prior to 1866.

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[1] The members of this Committee were M. E. Bannin, *Chairman*, D. Le Roy Dresser, *Vice-Chairman*, A. J. Baldwin, R. R. Bowker, Thomas C. Clarke, Joseph G. Deane, Horace E. Deming, Dr. Cyrus Edson, Dr. George B. Fowler, Prof. F. J. Goodnow, H. W. Goodrich, Charles L. Guy, Col. H. S. Haines, Rudolph Hering, F. W. Hinrichs, W. C. Le Gendre, Dr. Milo R. Maltbie, W. A. Marble, Prof. R. Mayo-Smith, E. P. North, E. E. Olcott, John M. Perry, Henry G. Prout, E. O. Richards, Jacob H. Schiff, Dr. Albert Shaw, J. R. Sheffield, D. McN. Stauffer, Simon Sterne, J. Kennedy Tod, Henry R. Towne, J. R. Van Wormer, R. W. G. Welling. S. Christy Mead, Frederick B. De Berard, Wm. R. Corwine and N. Flanter, were from the staff of the Merchants' Association.

3. The approximate average cost per million gallons in the year 1898 was $29.07, and in period 1898 to 1910 (the latest date when the present system and the works now being constructed will be able to supply the City with sufficient water even if recourse be had to meters and other means of reducing waste), it will be under $25.00 and probably in the neighborhood of $20.00, owing to the great relative decrease of outlay and increase of consumption during the next few years.

4. The annual cost of distributing water to consumers is not less than $10.00 per million gallons at present, and this expense should be added to the cost of delivering water at the city limits. The relative cost, therefore, to the City per million gallons by the proposed Ramapo contract, which fixes the price of water delivered at the northern limits of the city at $70.00, and by municipal ownership is approximately:

Contract Cost	$80.00		
Average City Cost, 1866-1898	35.06	Excess cost by contract	$44.94
Average City Cost, 1898-1910	25.00	Excess cost by contract	55.00
City Cost, 1898	29.07	Excess cost by contract	50.93

5. The city has received an average revenue of $52.87 per million gallons for all water supplied by the Croton system since 1865.

6. The Croton system had yielded up to the end of 1898 a net profit of $21,473,084. In the year 1898 it paid a net profit of $1,881,843. The ratio of profit is increasing rapidly and the annual net profit will probably exceed $4,000,000 by 1910.

7. The relative profit by municipal ownership and loss by the proposed Ramapo contract is:

CITY SYSTEM.

	1866–1898.	1898.
Average revenue per million gallons	$52.87	$50.29
Average cost per million gallons	35.06	29.07
Average profit	$17.81	$21.22

CONTRACT SYSTEM.

Average cost per million gallons	$80.00	$80.00
Average revenue per million gallons	52.87	50.29
Average loss	$27.13	$29.71

COMPARISON ON BASIS OF 1898.

Profit by City system	$1,881,843
Loss by proposed Ramapo contract	2,635,127
Total loss	$4,516,970

COMPARISON FOR PERIOD OF FORTY YEARS, 1906-1945.

POUGHKEEPSIE SYSTEM AND RAMAPO CONTRACT.

Net profit by City system	$48,338,259.55
Deficit under Ramapo contract	60,241,811.32
Cash loss	$108,580,070.87
Plus value of Poughkeepsie system, all bonds having been paid	$36,880,000.00
Cash and Property loss to City	$145,460,070.87
Estimated Cash and Property Loss on second system, constructed by 1920, capable of supplying 250,000,000 gallons daily additional	$50,000,000.00
Final Loss by the acceptance of Ramapo contract	$195,460,070.87

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For the purpose of comparison of the relative financial advantage of municipal ownership and the proposed Ramapo contract we have made calculations of the cost under both systems, as shown in the table above; we have taken as a basis for the municipal supply the Poughkeepsie system as recommended by the engineers, the ultimate cost of which is $36,880,000 for a supply of 250,000,000 gallons daily. We have assumed that a plant capable of delivering 100,000 000 gallons daily, would be completed in 1906 at a total cost of $29,691,000; we have further assumed that in each of the years 1911, 1914 and 1917 a further supply of 50,000,000 gallons daily would be needed and have calculated the cost thereof, making the total cost in 1917 $36,880,000. We have allowed for interest at 3 per cent, for a sinking fund of 4 per cent, for depreciation and the cost of operation. We find that in 1937 the bonds issued for construction would have been paid.

In calculating the cost under the contract system with the Ramapo Company, we have assumed a payment by the City to that Company for the same amount of water as delivered under the municipal system.

Both estimates are based upon an increase of population at a rate justified by the increase in the last few years and a consumption relative to such increase; we have also estimated that the total annual City receipts would be, as at present, $50.29 per million gallons.

The results of these calculations are as follows:

First—By 1837 the City would own its plant under the municipal system free from all debt, and would own nothing under the Ramapo system.

Second—Between 1906 and 1917 the City, under municipal ownership, would have an annual deficit beginning with about $1,800,000 in 1906 and ending with about $104,000 in 1917, but that thereafter beginning in 1918, the City would commence to make a profit which in that year would be about $133,000 and would constantly increase year by year until 1945 (a date chosen because it is the termination of the proposed Ramapo contract), in which year it would be about $3,100,000. The excess of this profit over the deficit in the forty years of operation from 1906 to 1945 would be about $48,000,000, a sum which represents the cash profit to the City during that period under municipal ownership.

Third—Under the proposed contract the payment to the Ramapo Company of $70.00 per million gallons, less the revenue from consumers at $50.29 per million gallons, would result in a deficit to the City of over $60,000,000.

Fourth—If, therefore, the City should fail to build and operate its own water supply and should make a contract with the Ramapo Company it would suffer a loss of $108,000,000 in the forty years of operation.

Fifth—But that amount of $108,000,000 does not represent the total loss to the City, for it would own no plant under the Ramapo System, while, under the municipal ownership plan, it would have paid for its plant by 1937 and own it free of indebtedness thereafter. The total cash and property loss, therefore, would be $145,000,000 on a system supplying only 250 million gallons daily.

Sixth—Furthermore, by 1920, another system to meet the increasing needs of the City and to supply an additional 250 million gallons daily, must be constructed. During the twenty-five years of the operation of this new system a further loss of at least $50,000,000 to the City would result, compared with a contract with the Ramapo Company, for such additional supply at the proposed price. This makes the total loss to the City during forty years over $195,000,000.

Seventh—The operation of increasing the supply from the Hudson every fifteen or twenty years by an additional supply of 250,000,000 gallons daily, is a perfectly feasible plan, not only from an engineering, but most of all from a financial standpoint. The supplying of water to its citizens becomes an increasingly profitable enterprise, while on the other hand contracting with the Ramapo Company would probably result in giving that company the monopoly of all future additional supplies for the City of New York.

PART II.

THE PRESENT SUPPLY

* * [Description of Present Supply.] * *

The year fixed above, 1903, as the date when the consumption will equal the supply, may be postponed if some of the waste can be lessened. This measure of precaution must be taken in order to save the boroughs from a water famine until a new and larger source of water supply can be obtained. The lessening of waste is, however, not merely a temporary expedient, but it will be a means of economy and security for the future. Modern hydraulic engineers and managers of water works are agreed that it is quite within the resources of engineering and administration to prevent a very considerable part of the waste. It is estimated by the engineers employed by the committee that the total daily waste is from 120,000,000 to 150,000,000 gallons daily, part of which is in houses, but the larger part of which is underground. A complete cure for the latter can be found by putting all water mains in subways, where they will be accessible for the detection and repair of leaks ; and the leakage can be materially lessened by other methods, all of which, however, are costly and slow of development.

A well-administered meter service has been found efficacious in other cities in discovering leaks in the mains, as well as inside of buildings, and has led to the repair of both mains and the plumbing in houses, resulting in a marked diminution in the daily waste. The engineers estimate that a substantial saving (ten per cent) can be effected by the prevention of waste and the present supply thus made to last until the year 1910.

Attention is also called to that portion of the Engineering Committee's report relative to a possible use of salt water for street cleaning and other purposes ; some saving of the supply might thus be effected.

We are thus brought to the conclusion that an additional supply for all the boroughs of the City is imperative, and that measures should be taken to furnish the additional supply at the earliest practicable moment. The Engineering Committee estimates that from six to seven and one-half years will be necessary from the inception of the work to the delivery of additional water. Your committee most strenuously urges that immediate steps be taken to furnish an adequate supply of water, to be available, at the latest, in 1910.

No words are necessary to convince the people of the City that one of the greatest calamities is an insufficient or impure supply of water.

PART III.

AVAILABLE SOURCES FOR ADDITIONAL SUPPLY.

Fortunately for the City of New York, abundant supplies of water can be obtained without any great engineering difficulties, and at a much less cost than the proposed Ramapo contract involves.

There are four great sources of supply which the committee has investigated : (1) On the east side of the Hudson River, the Housatonic and Ten-Mile River water-

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shed; on the west side (2) the Wallkill River watershed; (3) the watershed of the Catskills, viz.: The Esopus, Catskill and Schoharie creeks; (4) the Hudson River itself.

The first two named, the Ten-Mile and Housatonic rivers, and the Wallkill River, are interstate rivers and have been eliminated from consideration by reason of certain legal difficulties set forth in the report of the Committee on Legislation.

The Esopus and Catskill creeks, the sources from which the Ramapo Company proposes to supply the City under its contract, will yield about 260 million gallons daily, and the entire Catskill watershed, which includes Schoharie creek, will yield about 460 million gallons per day. This is probably the limit of the Catskill system. The Hudson River system, however, is capable of extension to 1,500 million gallons per day at relatively small cost.

For a discussion of other possible sources of supply, reference should be made to the accompanying reports from the Engineering Committee.

PART IV.

HUDSON RIVER SUPPLY.

All the additional water that the City of New York is likely to need for many years to come, until its population shall increase to 18,000,000, can be obtained from the Hudson River, above Poughkeepsie. It is proposed to build pumping stations and filter beds on the east side of the river, an aqueduct from Poughkeepsie to the northern limits of this City, and a reservoir near the northern limits. The plant thus constructed would be capable of supplying 250,000,000 gallons daily, although it is not proposed to build a plant capable of delivering at first more than 100,000,000 gallons daily. The 250 million gallons a day, combined with the present supply, will meet the needs of the city for fifteen or twenty years to come. Thereafter increased pumping facilities at the same point, with additional aqueducts, will furnish an additional supply in any amount up to 1,500 million gallons daily. It is proposed to filter this water, the experience of other cities having shown that filtration is a perfect method of purifying water, being, indeed, only a scientific reproduction of a process of nature. That filtration is effective in removing impurities and germs of disease is amply proved by the experience of Albany, Poughkeepsie, London (England), Hamburg (Germany), and other cities. It has already been recommended by the Health Board of the City for the Croton water.

The watershed from which this supply may be drawn comprises all the streams flowing into the Hudson above Poughkeepsie, including the Adirondack region. The area of the watershed is approximately 11,800 square miles.

In order to prevent the water above Poughkeepsie from becoming brackish, by reason of taking so large amount of water from the river at that point, it is proposed to build in the Adirondacks compensating reservoirs, in which may be stored the freshet waters during the months of excessive rain. These waters are to be delivered into the river during the dry season, so that the flow of water may be kept even throughout the year.

Incidental benefits would be the improvement of the navigation of the upper waters of the Hudson, the prevention of floods and the provision of a uniform flow for the mill owners along the various streams.

That the project is entirely feasible, the report of the Engineering Committee leaves no doubt. It has already had examinations made for reservoirs at various points in the Adirondacks, and has shown that it is entirely practicable to obtain the necessary storage without excessive cost.

As an alternative proposition to the pumping of water from the Hudson at Poughkeepsie, the Engineering Committee suggests the taking of water from the Hudson at the junction of the Sacandaga about 80 miles above Albany, whence it may flow by gravity through longer aqueducts to the City limits. Both projects require the construction of storage reservoirs to equalize the seasonal flow.

The Poughkeepsie project is more advantageous in that the streams below Glens Falls furnish an additional supply.

* * [Sources compared in detail.] * *

PART V.

THE RAMAPO CONTRACT AND THE EXPERIENCE OF OTHER CITIES.

The Ramapo Water Company was organized in September, 1887, under an act which, with its amendments, permitted companies organized under it to supply with water any municipality in the State of New York. In 1890 the act was repealed and a general law enacted which surrounded with new safeguards contracts made with companies organized under it. These safeguards did not apply to the already organized Ramapo Company; and a few years later the Legislature extended to that company privileges greater than those possessed by any other water company in the State, far greater than the privileges of the City of New York. This was done under the guise of an act (Chapter 985, Laws of 1895) which purported to "limit and define the powers of the Ramapo Water Company." This act gives the Ramapo Company full power to contract to supply water not only to any municipality, but to any corporation, public or private, with no requirements such as other companies must meet for filing an amended certificate, or obtaining the consent of the local authorities. The power to supply water for municipal purposes, and, in addition, to supply water for commercial use, given by this special act, is a power which no corporation can obtain except by special legislation, and is a power possessed only by the Ramapo Water Company. The company is also given broad powers of condemnation and may, without fear of opposition, select such route as it chooses; it is practically impossible for any one objecting to the route selected, within the time limit by the act, to comply with its provisions for making opposition to the condemnation proceedings, and, as an additional safeguard to the company, the expense of such opposition is made prohibitive. This is the method which the Legislature used to "limit and define the powers of the Ramapo Water Company."

While the Legislature has thus increased the powers of the Ramapo Company, it has very greatly restricted the power of the City to acquire its needful additional supplies of water. * * * * * *

The specific objections to the Ramapo contract are as follows:

First—The price is exorbitant.

Second—The contract is ambiguous as to the pressure at which the water is to be delivered at the City limits.

Third—The contract is ambiguous as to the respective duties and privileges of both contracting parties.

Fourth—The City will not own the plant at the termination of the contract.

Fifth—The effect of the contract will be to force the City hereafter always to purchase water from that company.

Sixth—It will deprive the City of large profits from a water supply owned by the City, or force it to raise the price of water, which would be injurious to its industrial interests.

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Moreover, the experience of other municipalities in the United States, as well as in other countries, shows an almost continuous tendency to substitute publicly owned water systems for private, a tendency so persistent and so universal, and of such constantly increasing force, that the wisdom, in the public interest, of the policy of municipal ownership and control of water supply, would seem established by abundant experience. * * [Municipal operation in other countries.] * *

PART VI.

LEGISLATIVE AND CONSTITUTIONAL OBSTACLES TO THE CITY'S ACQUIRING THE NEEDED ADDITIONAL SUPPLY.

The principal argument urged in favor of entering into the proposed Ramapo contract is the City's lack of power, through legal difficulties, to supply its necessities. It is urged that the City has not the power to condemn and so to acquire the properties it needs. Our answer is that the Legislature should give the City of New York this power. It is almost the only city in the state which does not already have that power. Why Brooklyn should be prevented from using the waters of Suffolk County, and why the present Charter of the City should so markedly have limited the City's power, while the Legislature has increased the powers of the Ramapo Water Company, we do not care to inquire, but that these limitations should be removed, no citizen of New York not interested in a water company will dispute.

It is urged, also, that there are constitutional difficulties in the way. To this we answer that these difficulties are exaggerated, and so far as they exist they will be quickly removed when the people who make constitutions realize the character of the difficulties and their unseasonableness. When our cities were incurring a burden of debt beyond their ability to meet, there was put in our Constitution a restriction upon their debt-incurring capacity. No city was permitted to incur debt beyond ten per cent of its real estate assessed for taxation. Later, on account of the absolute need that our cities should have an abundant supply of pure water, and in order to prevent their falling into the power of private water companies, the Constitution was amended so that, even though cities had reached their debt limit for other purposes, they were allowed to go beyond it to obtain a supply of water. This was due to the general recognition of the wisdom of the policy of municipal ownership and control of the supply of water. If, however, the City's debt, including its debt for water supply, exceeds the ten per cent limit, no debts for other purposes than water-supply can be incurred until the assessed valuation shall permit.

It is upon this provision of the Constitution that reliance is placed to compel the City of New York to supply by private contract its great need for water.

The demonstrated wisdom of the policy of municipal ownership of water supply, irrespective of the mere question of profit; the demonstrated great profit of that municipal policy in New York City, irrespective of any other question—these two factors, gaining in force every year in forming public opinion, are bound in a short time to compel the removal of the present constitutional bar.

We therefore believe that without waiting for any further constitutional amendment the City should at once take the necessary steps to provide for itself a supply of pure water ample for future needs. * * *

RECOMMENDATIONS.

The Committee therefore recommends as follows:

I. No contract whatever should be entered into with the Ramapo Water Company.

II. The policy of supplying New York City with water by contract should be opposed by all lawful means.

III. The Legislature should clothe New York City with power to acquire by condemnation any water rights needed for its public water supply, excepting water rights actually used by, or necessary for, the supply of any other city, town or village.

IV. The constitutional requirement that the bonds issued by New York City for a water supply shall be included in ascertaining whether the City can become indebted for other municipal purposes should be removed.

V. The Comptroller's quarterly and annual reports should contain a clear and businesslike statement of the financial status of the City's investment in its water works.

VI. A carefully devised system of detailed, accurate and easily understood public records and reports should be adopted by the Department of Water Supply.

VII. The financing by the City of any addition to its water supply should include the application of the surplus of the revenues over expenditures to the redemption of bonds issued to establish the plant.

VIII. Immediate steps should be taken by the City of New York to acquire an additional supply of 250 million gallons of water daily from the Adirondack Mountain watershed by either of the systems proposed in this report.

IX. Immediate steps should be taken by the City officials to prevent the waste of water.

COMMITTEE ON WATER SUPPLY,

M. E. BANNIN, *Chairman;*

S. C. MEAD, *Secretary.*

NEW YORK, August 8, 1900.

TAXATION OF FRANCHISES IN MASSACHUSETTS.

By James R. Carret.

The passage of the Ford bill by the legislature of the state of New York in 1899 was an attempt to tax the franchises or privileges granted to what may be called public service corporations.[1] The franchise which this law aimed to tax was not the right given by the state to be a corporation, but the right to use public property, the streets, highways, parks, *et cetera*, for a specific purpose. These two franchises should be clearly differentiated, for they are entirely different in theory, and the courts have applied to each different rules of law. It is the right to use public property—the "special franchise" as the New York law calls it—which concerns us here; but it is necessary to deal to some extent with the right to be a corporation, as taxation of this franchise has been used to reach "special franchises".

Massachusetts has had in force for thirty-five years a system of taxation of corporate franchises which includes not merely public service corporations but all corporations chartered by or organized under any law of the state for purposes of business or profit. A description of this system, its origin, its growth and its practical working may be of value to those in other states who are seeking to improve methods of taxation.

RAPID INCREASE OF CORPORATIONS.

At the end of the Revolutionary war, no corporations for purposes of business or profit existed in Massachusetts. But before the close of the century a good start had been made, as shown by the following list, which gives the dates when the first corporations were incorporated:

[1] See *The Ford Act: Taxation of Local Franchises* by John De WittWarner, Municipal Affairs, June, 1899, p. 269.

KIND OF CORPORATION.	WHEN FIRST INCORPORATED.
Bank	February, 1784
Bridge corporation	March, 1785
Manufacturing corporation	February, 1789
Canal "	" 1792
Aqueduct "	" 1796
Turnpike "	June, 1796
Fire insurance "	March, 1798
Marine insurance "	February, 1799
Savings institution (or bank)	December, 1816
Gas-light company	January, 1823
Steam railroad corporation	June, 1830
Street railroad "	May, 1853

During a period of 25 years, beginning with the year 1784—the first complete year after the termination of the Revolutionary war—2,290 acts were passed by the legislature, of which 414 or 18 per cent were acts chartering or relating to corporations. In the first 7 years, 487 acts were passed, of which only 5 related to corporations. In the last 7 years, 928 acts were passed, of which 275 or 29.6 per cent affected such corporations.

It would doubtless be interesting to obtain the exact facts as to the amount of legislation relating to such corporations in the years following that period, but it is hardly necessary to do so to indicate the rapid development of the corporate idea and the great increase in the number of corporations in this state, as well as in other states, which is known to everyone. It should be noted, however, that this increase has been influenced not only by the growth of the community, but also by the greater ease in obtaining charters after the legislature, becoming tired of granting a special charter in each case, began to provide general laws for the voluntary formation of corporations. The first was passed in 1851.

The basis of the chief part of the Massachusetts system of taxation is the general property tax, that is, the idea that everything which is called "property" should be taxed. The constitution of 1780 gave the legislature

full power and authority * * to impose and levy proportional and reasonable assessments, rates, and taxes, upon all the inhabitants of, and persons resident, and estates lying within the said Commonwealth; and also to impose and levy reasonable duties and excises upon any produce, goods, wares, merchandise, and commodities, whatsoever, brought into, produced, manufactured, or being within the same. (Part 2, ch. 1, § 1, art. 4.)

The laws of taxation in Massachusetts follow the familiar legal division of property into real and personal. Real estate is construed for purposes of taxation "to include all lands within this

state and all buildings and other things erected on or affixed to the same",[1] and is taxed, of course, in the city or town where it lies. Personal estate for purposes of taxation includes, *inter alia*, "all goods, chattels, money and effects wheresoever they may be, * * public stocks and securities, stocks in turnpikes, bridges and monied corporations within or without the state."[2]

In contemplation of law, personal property follows the owner and the laws of taxation conform to that rule in providing that all personal estate shall be taxed in the place where the owner resides. To this rule, however, some marked exceptions were made early in the century, one of which was:

> All machinery employed in any branch of manufactures and belonging to any corporation, shall be assessed to such corporation, in the town or other place where such machinery may be situated or employed; and in assessing the stockholders for their shares in any manufacturing corporation, there shall first be deducted from the value thereof the value of the machinery and real estate belonging to such corporation.[3]

Besides these general provisions, every bank was subjected to a special tax of one-half of one per cent, payable semi-annually within ten days after the first Monday of April and the first Monday of October, on the amount of its capital stock actually paid in.[4] The first act imposing such a tax was chapter 32 of the Acts of 1812, which required every bank to pay a tax of .5 per cent on its amount of capital stock paid in, within ten days after each and every semi-annual dividend made after a certain date, and was held constitutional in Portland Bank *v.* Apthorp, 12 Mass., 252: In this decision the court declared the tax to be an excise upon the privilege granted to the plaintiff under its charter from the state, or in modern terminology, a tax upon its franchise, which was held to come within the term "commodities" used in the constitution.

Such were the provisions of the Revised Statutes of 1836, the first codification of the general laws of Massachusetts. Prior to the Revised Statutes, there appears to have been no standing law defining the property upon which taxes should be assessed. The provisions for that purpose were apparently incorporated in the law annually passed for the assessment of a state tax which was apportioned among the several towns of the state. The tax act of the year 1821 (ch. 107) provided for the assessment of taxes upon, among other things,

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[1] Revised Statutes of 1836, ch. 7, § 3. [3] Revised Statutes of 1836, ch. 7, § 4.
[2] Revised Statutes, ch. 7, § 10, but this first appears in Acts of 1832, ch. 158, § 3.
[4] Revised Statutes, ch. 9, §§ 1 and 2, originally contained in Acts of 1813, ch. 190, and Acts of 1814, ch. 50.

public securities of all sorts and all bank and insurance stock and shares or property in any incorporated company for a bridge or a turnpike road or shares in any other incorporated company possessing taxable property, according to the just value thereof.

This is more explicit than the Revised Statutes already quoted.

Under the system established by these general provisions of law, corporations appear to have been taxed as follows:

First, as to real estate: All classes except railroad, turnpike and bridge corporations and possibly also canal corporations were taxed on their real estate in whatsoever town it lay; the four excepted classes were subject to a different ruling due to their different character and the different method of acquiring real estate. All other classes of corporations above referred to acquired real estate, like individuals, only by purchase, but these four classes of corporations acquired lands either by purchase or by exercising the power of eminent domain delegated by the state. The law as to the taxation of real estate[1] of railroad corporations (steam railroad corporations) was determined in Worcester *v.* Western R. R. Corporation, 4 Metcalf, 564., and the reasons of the decision apply as well to turnpike, bridge and canal corporations.

In this case the town of Worcester had attempted to tax the corporation on its buildings, namely, passenger depot, freight house, car house and engine house, in the town as real estate, liable to taxation for town and county taxes. Some of the buildings were partly within and partly without the limits of the location. The opinion of the court, delivered by Chief Justice Shaw declared that the establishment of the railroad

is regarded as a public work, established by public authority, intended for the public use and benefit, the use of which is secured to the whole community, and constitutes therefore, like a canal, turnpike or highway, a public easement * * * * [and] that to some extent at least, the works necessarily incident to such public easement, are public works, and as such exempted from taxation. Such we believe has been the uniform practice in regard to bridges, turnpikes, and highways, and their incidents; and also in regard to other public buildings and structures of a like kind; as state houses, forts and arsenals, court houses, jails, churches, town houses, school houses.

The court said further that the only question was as to the limits of this exemption from taxation, and held that as to the land within the location taken by eminent domain that and the structures or parts of structures upon it were exempt from taxation, but that structures or parts of structures outside of the limit of location (and presumably also land acquired by purchase outside of the location) were not within the exemption, but were subject to taxation.

[1] I include in the term "real estate" of a railroad corporation both the lands taken by it for general railroad purposes, technically termed the location, in which, of course, it has an easement, a nd also lands acquired by purchase for any railroad purpose.

Second, as to personal property: All classes of corporations were here on the same footing and appear not to have been taxed at all, except that manufacturing corporations were taxed on their machinery in the place where it was situated or employed, in accordance with the second exception, above quoted.[1] The tax act of the year 1821 expressly exempted from taxation machinery in cotton and woollen manufactories, and this exemption appears to have continued until repealed by chapter 143 of the Acts of 1828.

Doubtless the reason for this was that the several stockholders were taxable for their shares in their respective places of residence.[2] This is stated to have been the law as to the taxation of corporations in respect of personal property before the passage of c. 208, acts of 1884, by Chief Justice Bigelow in Commonwealth *v.* Hamilton Manufacturing Co., 12 Allen, 298 :

> Under the general laws regulating taxation in Massachusetts, corporations have never been liable to taxation for any personal estate owned by them, with the exception of machinery. * * * All other taxation, so far as it bore on corporate property, prior to the enacting of the statute in question (ch. 208 of the Act of 1864) was uniformly assessed on the stock as represented by the shares belonging to the individual stockholders, and was taxed to them according to the number of shares held by each in their respective places of abode, on a valuation ascertained by the market value of the shares, irrespective of the amount of property held by the corporation. These shares were declared by the statute to be personal property, for the purpose of taxation; Gen. Sts., c. 11, § 4 ; and were so treated, although the whole or a large part of the corporate property may have consisted of real estate, as in wharf, mining and water power corporations, and the like. Gen. Sts., c. 61, §§ 5, 10 ; c. 68, § 20. This tax on shares was clearly not a tax on the property of the corporation, but on the right or interest of each stockholder in the whole corporate organization, its franchise and privileges, as has already been explained, estimated at its market value.

This review of the former laws of taxation in Massachusetts shows that no tax whatever was imposed directly on the franchise of corporations, but that franchises were in fact taxed to the extent that they were reached by the taxation of the shares of the cor-

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[1] Acts of 1832. ch. 158, § 2.

[2] Though the language of the tax acts is broad enough to cover the personal property of corporations as well as of individuals, and though the exemption specifically of the machinery of cotton and woollen manufacturing corporations naturally produces the inference that without such exemption it would have been liable to taxation, and the provision that the machinery of manufacturing corporations shall be taxed in the place where it is situated or employed naturally gives rise to the inference that otherwise it would have been taxed to the corporation in the town where it had its principal place of business, and though there was no express provision of law that corporations should not be taxed in respect of their personal property, nor any express provision that they should (except in the case of manufacturing corporations as to their machinery as above stated) yet that they were not taxable in respect of personal property, except manufacturing corporations for their machinery, appears to have been the practical interpretation of the law.

porations to the individual stockholders in their respective places of residence at the *market value* of the shares. Such taxation, however, of shares in corporations was made upon assessments by the local assessors. At first assessors were dependent upon returns made by individual stockholders, and upon such information as they might get by inquiry, for knowledge of holdings of shares in corporations by residents of their respective towns, but beginning with the year 1843, acts were passed which imposed upon the cashier of every bank, the clerk of every railroad corporation, of every insurance company except mutual insurance companies, and of every manufacturing bridge, turnpike and canal corporation, the duty of making returns annually between the first and tenth days of May to the assessors of every city or town of the Commonwealth in which any shareholder in the corporation lived, giving the name of each owner residing in the city or town, with the number of shares belonging to him on the first day of May of that year, the *par* value of the shares, and by requirement of a subsequent act, the *market value* of the shares.

There were in Massachusetts in the year 1841, 305 towns and three cities, and now, by reason of subsequent subdivisions, annexations and incorporation of towns as cities, there are 335 towns and 33 cities. With 300, more or less, boards of assessors investigating the market value of the stock of different corporations, ascertaining the real estate on which they were locally taxed, and in the case of manufacturing corporations the machinery also locally taxed, it is clear that even if all performed their duties with diligence and skill and adequate valuations of the shares were made for purposes of taxation, such a system would be wasteful of time and effort. One would rather expect, however, that there were marked differences in the care and skill exercised in the performance of duties and decided variations in estimates of market values, for there must have been then, as now, there were many corporations whose stock was not bought and sold in the open market, and whose market value or assumed market value could not therefore be determined except by special and thorough investigation. But both before the passage of the law which required returns of holdings in corporations to be made to the assessors in the several towns, and after it, while this system existed, it is clear that as to all shares in every corporation held by persons living outside of the state, that portion of their market value which exceeded the

proportion of that value corresponding to the value of the real estate and machinery locally taxed, escaped taxation entirely.

This system of assessment continued in force until the Civil war produced such an increase in public expenditure as to cause legislators to look about for additional sources of revenue. Beginning with the year 1862, various acts were passed for the taxation of corporations, fire, marine, and fire and marine insurance companies and savings banks first receiving attention (Acts of 1862, c. 224). A general law for the taxation of corporations was passed in 1864 (c. 208), which contained the foundation principle of the present system, the tax being levied on the market value of all the capital stock after making certain deductions. This act was superseded in the following year by the act (c. 283) which embodies the substance of the present law.

FRANCHISE TAX UPHELD BY THE COURTS.

Before describing how the system established by this last act actually operates, let us glance at a few judicial decisions which interpreted these earlier statutes and upheld the legality of the statutes. The corporations strove to avoid payment of taxes, contested the constitutionality of the statutes and attacked their provisions in other ways. The act taxing savings banks, although its object as expressed was "to levy taxes * * * on depositors in savings banks," in fact levied an annual tax on every savings bank, payable in two semi-annual instalments, on the average amount of its deposits for the six months preceding each of two dates in the year, and this tax was held valid as an excise on the franchise of the corporation in Commonwealth *v.* People's Five Cents Savings Bank, 5 Allen, 428, and also in Commonwealth *v.* Provident Institution for Savings, 12 Allen, 312, notwithstanding that in the latter case part of the deposits were invested in United States bonds, and this latter case was affirmed by the supreme court of the United States in Provident Institution *v.* Mass., 6 Wallace, 611, and see also the preceding case, Society for Savings *v.* Coite, 6 Wallace, 594 (a Connecticut case, upon a statute requiring savings banks to pay a tax of a certain percentage upon the amount of their deposits on a certain day).

The power of the legislature to require domestic corporations o pay a tax upon the excess of the market value of their capital ock above the value of their real estate and machinery, taxable

where situated, as an excise on the franchise or privilege of each corporation was affirmed in Commonwealth *v.* Lowell Gas Light Co., 12 Allen, 75, although the decision in that case turned upon other points. But the question was more fully considered and affirmed in three cases reported together and generally cited under the name of the first, Commonwealth *v.* Hamilton Manufacturing Co., 12 Allen, 298, in which cases it was also decided that the fact that such a corporation owns as part of its personal property U. S. bonds, and that some of its stockholders live outside of the state, will not exempt it from liability to pay the full amount of such tax. This decision that the tax was valid as a franchise tax was affirmed by the United States Supreme Court in Hamilton Co. *v.* Mass., 6 Wallace, 632.

Another important case under the Act of 1864 was Commonwealth *v.* Cary Improvement Co., 98 Mass., 19. The defendant was a land company. The tax assessed was based upon actual sales of the company's stock, and the defendant contended that the tax was unreasonable in the sense of the constitution, part 2, ch. 1, § 1, art. 4, being computed on a speculative value exceeding the value of all the property owned by the corporation. The court held that it was not unreasonable in the sense of the constitution, that it was not levied as a tax on property, but was an excise tax; that the value of the property of the corporation was not intended to furnish the basis of the taxation, but the value of the capital stock, which might be determined by actual sales.

METHOD OF VALUING FRANCHISES.

The present system for the taxation of corporate franchises, based upon charter 283 of the Acts of 1865, is as follows: The treasurer of the state is the tax commissioner, and has a deputy who is commissioner of corporations. Every corporation chartered by or organized under the general laws of the state for purposes of business or profit, having a capital stock divided into shares,[1]

[1] The only exceptions to this sweeping provision are banks (no state banks exist), corporations chartered or organized for the purpose of engaging without the limits of the state in the business of coal mining or other mining, quarrying or extracting carbonaceous oils from the earth or for the purpose of purchasing, selling or holding mines or lands without the state, corporations formed under the general laws to construct railroads or railroads and telegraphs in foreign countries, and also savings banks, life insurance companies and mutual insurance companies all of which are subjected to special excise taxes. All companies, co-partnerships and other associations having a location or place of business within the state, if the beneficial interest is held in shares which are assignable without the consent of the other associates specifically authorizing such transfer, are subject to the same method of taxation as domestic corporations.

is required to return annually, between the first and tenth of May to the tax commissioner under the oath of its treasurer a complete list of its shareholders with their places of residence, the number of shares belonging to each, the amount of the capital stock, its place of business, and the par value and the market value of the shares on May first. The return shall also state for stock held as collateral security, both the name of the holder and the name of the pledgor and his residence. Further, it shall contain a statement in detail of the character, location and value of the works, structures, real estate and machinery owned by the corporation and subject to local taxation *within* the state. Every corporation, except railroad and telegraph companies, shall also return the amount, value and location of all works, structures, real estate and machinery owned by it and subject to local taxation *without* the state. Railroad and telegraph companies give the whole length of their lines and the length of so much of their lines as is without the state.

Every guardian who holds, or whose ward holds, shares of stock in any corporation and every executor, administrator or other person who holds in trust any such stock, shall between the first and tenth days of May in each year return under oath to the tax commissioner their names and residences on the first of that month and those of all such wards or other persons to whom any portion of the income from such stock is payable, the number of shares of stock held and the name and location of the corporation, etc., in which they are held. Every partnership also is required to make like returns stating the amount of such stock owned by the firm, the names and residences of all partners and the proportional interest or ownership of each in the stock.

It is the duty of the assessors of every city or town on or before the first Monday of August to return to the tax commissioner the names of all corporations except banks of issue and deposit, having a capital stock divided into shares chartered by or organized under the general laws of the state for the purpose of business or profit and established in their respective cities or towns or owning real estate therein; also a statement in detail of the works, structures, real estate and machinery owned by each corporation, the amount for which the same is assessed in the city or town for the current year, and also at the same time to return to the tax commissioner the amount of taxes laid or voted to be laid within the city or town for all town purposes.

The tax commissioner is required to ascertain from the returns or otherwise the true market value of the shares of each corporation and to estimate therefrom the fair cash value of the capital stock on the preceding May first, which is to be taken as the value of its corporate function for the purpose of taxation. He shall also ascertain and determine the value and amount of all real estate and machinery owned by each corporation and subject to local taxation and of the deductions mentioned below. For this purpose, he may take the amount at which such real estate and machinery are locally assessed, but this local assessment is not conclusive.

In case the value of the real estate and machinery, located within the state, of any corporation, as determined by the tax commissioner is less than the value fixed by the local assessors, the commissioner is to notify the corporation of such determination and the corporation thereupon within one month may make application to the assessors for an abatement, and if such abatement is refused, prosecute an appeal to the county commissioners of which it must give notice to the tax commissioner. The decision of the county commissioners is conclusive as to the value. If the corporation fails to apply for an abatement, or having made such, if it fails to appeal from the decision of the assessors, the determination of the tax commissioner is conclusive.

Every corporation so taxable shall annually pay a tax upon its corporate franchise at a valuation thereof equal to the aggregate value of the shares in its capital stock, as determined by the tax commissioner, after making the deductions mentioned below, at a rate determined by an apportionment of the whole amount of money to be raised by taxation upon property in the state during the same current year as returned by the assessors to the tax commissioner, as above mentioned, upon the aggregate valuation of all the cities and towns for the preceding year as returned annually by the assessors to the secretary of state.

From such valuation of the corporate franchise so determined, the following deductions are made:

First, in the case of railroad and telegraph companies whose lines extend beyond the limits of the state, such proportion of the whole valuation of their capital stock, as the length of line lying without the state is to that of the entire line, and also an amount equal to the value of the real estate and machinery locally taxed within the state.

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Second, in the case of all other corporations subject to this form of taxation, an amount equal to the value of the real estate and machinery subject to local taxation wherever situated.

A corporation taxable under these provisions, if aggrieved by the decision of the tax commissioner, may appeal to a board consisting of the state treasurer, state auditor and one member of the council designated by the governor.

Although these taxes on corporations are assessed and collected by the state, the disposition of the greater part of them is the same as when the shares were assessed to the owners by the local assessors. The proportion of the taxes corresponding to the proportion of the stock of the corporation owned by residents of the state is credited and paid to the several cities and towns where it appears from the returns or otherwise that such shareholders lived on the first of May preceding, according to the number of shares so held in each city and town. The remainder, collected on shares held by persons living out of the state, is retained in the state treasury.

FINANCIAL RESULTS.

Turning now to the practical results of this system of taxation, I have obtained the following from the state auditor's report for 1899: The total amount collected in that year by the state treasurer was $5,202,266.67 from 1908 corporations, which includes the amount directly collected, assessed in the year 1899, of $5,134,983.77. The sum received in 1899 from delinquent corporations on account and previous years, was $49,934.52. And from cities and towns on account of over-payments of their shares of corporation taxes in 1898 and previous years, $17,348.38 were received. Total, $5,202,266.67. Of this sum the state paid to cities and towns on account of the years 1898 and 1899, $4,253,136.10, leaving $949,130.57 as the revenue derived by the state.[1]

The rate of the corporation tax in the year 1899 was obtained according to the method described above, by apportioning the

[1] The total revenue of the state in the year 1899, deducting the portions of corporation taxes and national bank taxes paid to cities and towns, was $8,817,380.50, of which the sum derived by the state from the general corporation tax as shown above ($949,130.57) was 10.76 per cent. But this is not the total revenue derived by the state from corporations. Other taxes are the savings bank tax, excise tax on life insurance companies, tax on the Massachusetts Hospital Life Insurance Company, annual insurance companies' tax, life insurance companies' tax, coal and mining companies' tax, railroad commissioners' tax, foreign railroad companies' tax, and very small sums in the shape of fees from the gas and electric light companies. The total for 1899 was $2,032,961.86 which is 23.62 per cent of the total state revenue.

total amount of taxes assessed for state, county and city or town purposes in the whole state in 1899, as returned by the assessors of each city and town to the tax commissioner, upon the aggregate valuation of real and personal property in the state for purposes of taxation in 1898, as returned by such boards of assessors to the secretary of state. The rate thus obtained is practically the average rate of taxation throughout the state, and for 1899 was $15.78 per thousand dollars. Applying this rate to the corporation tax assessed and collected—$5,134,983.77—, it appears that this corporation tax was collected upon an aggregate valuation of the excess of corporate franchises thus taxable of $325,410,885.

From the tables in the auditor's report for 1899, I have taken out the various public service corporations, and find the number of such, and the taxes paid by them to be as follows:

39	Steam Railroad Companies	$1,642,626.45
97	Street Railway Companies	746,892.86
73	Gas and Electric Light Companies	115,783.97
37	Water Companies	15,833.88
16	Telephone and Telegraph Companies	793,662.04
5	Miscellaneous Companies	15,237.01
		$3,330,036.21

This is 64 per cent of the total amount obtained by the state from the general corporation tax in 1899, and represents an aggregate valuation of the excess of these corporate franchises thus taxable of $211,028,910.

HOW THE TAX SHOULD BE DISTRIBUTED.

One feature of the Massachusetts system of taxing corporations is open to criticism, viz., the method of distributing the proceeds, as already stated, the taxes paid by corporations, though collected by the state to the extent that shares in them are held by residents of the state, are credited and paid to the various cities and towns in which the stockholders live.

In the case of public service corporations, the value of the franchise depends upon the concentration of the population in the cities and towns where these corporations have their tracks, pipes, lines and plants. To the extent that the expenditure of taxes in these cities and towns makes them desirable as places for business and residence, and attracts population, such corporations

get a benefit from the local expenditure; but the franchise taxes which these corporations pay do not necessarily go to the cities and towns where the corporations are located; they are distributed solely with reference to the places where the various stockholders have their domiciles. A concrete illustration shows best the unfairness of the method.

Under a resolve passed by the legislature in 1896, a commission was appointed "to inquire into the expediency of revising and amending the laws of the Commonwealth relating to taxation." This commission made its report in October, 1897, and in it called attention to the concentration of well-to-do taxpayers and of their personal property in a limited number of towns. I quote from this report the following table showing the distribution of the corporation tax, and a comment upon the results shown by the table.

	Population 1895.	Tax Distributed 1896.	Tax Distributed per capita.
State	2,500,183	$2,585,795.63	$1.03
Thirty-two cities	1,635,767	1,778,359.23	1 08
All towns	864,416	807,436.40	.93
Eighteen towns	62,529	332,310 77	5.31
Three hundred and three towns	801,887	475,125.63	.59

The eighteen selected towns get five times as much as the average for the state, per head of population, of the proceeds. As compared with the remaining towns, less fortunate in the ownership of securities by their inhabitants, these few towns get nearly ten times as much per head of population. The commission recommended that the county expenses should be assumed by the state and that the proceeds of the corporation tax should be retained by the state and applied to paying county expenses.

The question how to distribute these corporation taxes so as to adjust the burdens of taxation fairly, is not an easy one but certainly in the case of steam railroads good reasons can be given why such corporation tax should be retained in the state treasury, though these reasons would perhaps have less force when applied to the other public service corporations whose field is much more limited. Of course, the Massachusetts method of distributing the corporation tax is not an essential part of the system. If this tax is to be distributed among the different cities and towns, there is no reason why some other method should not be followed as, for instance, distributing it either in proportion to the population or to the assessed values of property.

It is not within the scope of this article to make any comparison between the Ford bill and its amendments, and the Massachusetts system of taxing corporate franchises. The problem, how to tax these franchises, is a local one in each state involving consideration of constitutional provisions, existing laws in relation to taxation, perhaps special legislation in regard to corporations or different classes of corporations, possibly also contracts made by municipalities with particular corporations, or locations granted by them to corporations on special terms and conditions, and, last but not least, decisions of the courts. One state may find the course of legislation in another useful as affording suggestions, but may not be able to make a close imitation of it. As to the Massachusetts system of taxing corporate franchises, it may be said that the state has been fortunate in developing a system, which is simple, which is easily worked, which reaches the corporations, and above all which is solidly established by decisions of the courts.

But let me not be understood as regarding this system as a finality. As long as the people look upon the general property tax as the guiding principle in taxation, this system of taxing corporate franchises may be well enough. But when the people learn to appreciate that the use of public ways is essential to the existence of the public service corporations, that the grants of privileges in public ways and public places is simply a gift of public property, and that in creating such franchises the community abdicates a performance of duties that it should itself undertake as part of the service of the government, then the time will arrive when they must consider how the government can resume its proper functions, and how to assert the right arising under Article VI of the Declaration of Rights prefixed to the Constitution of Massachusetts,

> that no man or corporation or association of men have any other title to obtain advantages or particular and exclusive privileges distinct from those of the community than what arises from the consideration of services rendered to the public.

It will be the task of the community then to find some way to make every individual and corporation, possessing any such privilege, render an adequate equivalent for it to the public. Exercise of the taxing power would be one means to that end.

STATE CONTROL OF CORPORATIONS.

By James Blake Cahoon.

If we consider the general question of what form our laws shall take in order to secure the greatest benefit to the people and municipality in the management of public utilities, it will, I think, be conceded by all who have made a careful study of this subject, that our legislatures should be governed by the spirit of the utmost fairness to invested capital as well as to the people. These laws should be definite, and forecasting the future somewhat, will undoubtedly prescribe state control, to a greater or less degree, for all forms of service that may be classed as public utilities. Almost necessarily the execution of such laws should be placed in the hands of a commission composed of at least two, and not more than three, members chosen by popular vote and not appointed for political reasons; and in order that the best results may be obtained, the term of office should be a long one, similar to that of the justices of the supreme court of the State of New York; and while holding office the members should not engage in any other business.

COMPETITION SHOULD BE ELIMINATED.

This class of corporations should not in any sense include those corporations which are open to competition. The fundamental basis of the former is that they are of a right and should be absolute monopolies. Only by so construing their rights can the best service be given to the people. Formerly it was held that, in order to secure cheap rates, it was necessary to have competition, but years of competition prove that competition raises prices instead of lowering them, as will be seen when we consider the actual result of two electric light companies competing in the same town. First one and then the other cuts the price until both are losing money. The inevitable consolidation takes place. One plant is shut down, the other operated; but the interest on the bonds of both has to be paid, and the excess of interest over what should be

required for a plant of sufficient capacity to supply the town ultimately comes out of the pockets of the people. If competition had not been let in, only the interest charges for the proper sized plant would have to be met, and therefore the corporation could furnish the light at a less price and make an equally good profit for itself.[1]

Let us assume then that these public utilities are monopolies and are protected as such. It immediately becomes the function of the commission to lay down as the first prime requisite of cheaper rates, that there shall be only one corporation supplying a given public service in any town. Public control, being established, should look, first, to the protection of the people; second, to the protection of the capital invested; and third, to the rendition of service at such a price as will permit of its general use, and return to capital a fair interest on its investment.

SECURITIES SHOULD BE LIMITED.

The first question to arise is whether bonds or stock or both shall be issued and to what extent. The laws of Massachusetts permit the issue of both bonds and stock to pay the cost of construction, but only in amount necessary for the work in question, and the issue must be approved by the board of commissioners, with the understanding that no stock shall be sold at less than par. The capitalist who wants to invest money in a corporation of this kind cannot issue what bonds and stock he thinks he can pay interest and dividends upon. He is barred from watering either the stock or the bonds.

This may appear arbitrary, and in a certain way it is. The legislature sought to protect the investor, and if one looks at the matter in all its bearings, it will be seen that this power of limiting the amount of securities issued is equally a benefaction to the real capitalist and to the innocent investor. The only one injured is that modern pirate, politely called the promoter. But even though this power does protect the investor and capitalist, and indirectly the consumer, by minimizing the interest charges on the plant, it is a question whether such interference—the saying to a man he shall not invests as he pleases or take such risks as his own judgment dictates—is not exercising too much of the paternal right to be altogether satisfactory to the general mass of

[1] For the experience of Great Britain, see an article in this issue.

the people. I should rather say that the commission should have the power to limit the bond issue to the actual cost of the plant and permit the organizers to issue whatever amount of stock their judgment deems best.

Possibly the better plan to protect both parties, and eventually inure to the benefit of the plant, would be for the commission to authorize the issuance of bonds to such an extent that seventy per cent of the bonds issued would pay the cost of the plant and the remaining thirty per cent be deposited with a trust company who, by receiving the interest on the thirty per cent and placing the same at compound interest, would be enabled to guarantee and pay the whole issue at maturity, say in thirty years. This would effectually take care of the much mooted question of retiring the bond issue at maturity.

FRANCHISES TO BE GRANTED BY STATE BOARD.

The commission should have the power to determine the life and form of contract entered into between the corporation and the municipality. The prevailing method of granting franchises by resolution of the council is open to serious objection. In one city a corporation may be able to so influence the council as to secure a grant that is very advantageous to the corporation and an equal hardship to the municipality, while in an adjoining city conditions may be reversed. This should be a strictly business transaction, and the contract should be determined by local conditions and so fixed as to be equally beneficial to both parties. It is impossible to eliminate self interest, and hence to secure equal justice both parties should be willing and glad to leave the adjustment to a disinterested party like the commission. This has never been done in the United States that I am aware of, but it is a solution of the difficulty which stands in the way of securing the best return to the municipality for the money expended as well as a fair profit for the corporation undertaking to serve the municipality.

In framing a franchise grant, lower prices should be considered rather than a large cash compensation to the city. In some instances, the municipal authorities have set an arbitrary rate at which the corporation shall sell its commodity. This is a needless restriction and too arbitrary, for the council is incompetent to judge of what constitutes a fair price for the commodity, and the corporation naturally seeks to make as large a profit on the enterprise as possible, and to do this would not place a price on its

commodity which would prevent its free purchase. The phrase, "large sales and small profits," is particularly applicable to this class of business enterprises, and the lesson has been well taught by the many failures of corporations to declare dividends, their price having been set so high as to make the use of their commodity a luxury and hence limit its output. In seeking the reason for their failure, this fact has been exhibited so clearly as to widely emphasize the economy of large use at low prices.

TAXES SHOULD BE MODERATE.

Many methods of taxing public utilities as such have been tried but none of them are satisfactory, for the reason that legislators have conceived the idea that this class of corporations should be throttled rather than assisted. I hold that public service corporations are public benefactors and should be encouraged in every way.

Further, the imposition of a tax raises the price of the commodity. In other words, the state and municipality impose a burden on the citizens of a community having public utilities, that is not placed upon those not having such, which works in effect to the repression of such utility and to the restriction rather than the extension of its use. The more advanced a community becomes, the heavier the tax imposed upon it. The state, which should do all possible to promote the comfort and enlightenment of its citizens, stands arrayed against such progress, merely because the authors of its taxation laws did not comprehend the first principles of economics. Public utilities are primarily for the benefit of the people, and instead of the state doing that which will enhance the price of their commodities, it should do all in its power to lower the price so that the maximum number of its citizens may be able to benefit from their general and wide-spread usage.

The citizen and legislator should clearly comprehend that though legislatures may pass laws imposing a tax upon the franchises and property of public corporations, it is not the corporation that ultimately pays the tax but the users themselves; for in making up the price at which it will sell its commodity, the corporation first determines the cost, and one of the principal factors in the cost is the amount of taxes paid. To this cost is added the profit determined on, the sum being the price to the consumer—

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the citizen who wanted the tax imposed on his arch enemy, the public corporation.

CITY AND CORPORATION TO BE PARTNERS.

We have been working in a wrong direction, and I believe the right solution, and one that must ultimately be adopted, is for the municipality and the public corporation to form a joint partnership on some such basis as the following:

First: The municipality to give one corporation alone the necessary perpetual franchises and rights to enable it to successfully prosecute its business.

Second: The bonds to be amortized by annual payments to a reserve fund, which shall, with the interest on the bonds, enter as a factor into the cost of the product, the municipality guaranteeing the payment of the bonds and interest.

Third: The corporation to be permitted to conduct the business, and the two with the commission jointly to fix a price so that after reckoning all the factors of cost, there shall be allowed to the corporation as a first profit, an amount equal to the legal rate of interest on the cost of the plant, and as much more profit as they may decide. The additional profit to be divided one-third to the corporation and two-thirds to the municipality. The receipts from this source to be treated as taxes received and apportioned between the town, county and state in accord with the tax levy.

The benefits to be derived from such a plan would be:

(1) The lowest possible price to the people.

(2) The maximum stability and usefulness of the corporation to the community.

(3) The divorcing of public utilities from politics.

Such a radical change of public policy would necessarily take years for accomplishment, and the plan outlined therefore partakes somewhat of the nature of a prophesy. Neither legislators nor people, in there blind efforts to suppress the growth of capital, will look at the matter in the light thus presented until dear experience has taught them the necessary lesson.

With the establishment of a commission, it almost necessarily follows that such commission should be the arbitrator on all differences of opinion that might arise between the citizens and the corporations, and between the municipality and the corporation. This involves the setting of a standard of service by the com-

mission, and its duties should extend to the strict enforcement of the standard set.

The commission should prescribe the method in which the corporation should keep its accounts and should require such corporation to render to the commission a statement of all its receipts and disbursements on a prescribed form and in such manner that the cost of furnishing the commodity shall be shown, and also the profit which shall be apportioned in the manner set forth above. This statement should be rendered at least annually and the commission should make a report to the legislature in such form that all the matters required from the corporation in their report shall be presented in detail and published in pamphlet form in sufficient number to supply all directly interested.

The commission should be required to investigate all serious accidents and should have the power to enforce such regulations as they may deem best for the public safety.

In general then we may sum up the matter as follows:

1st. Public utilities should be monopolies and exempt from ordinary taxation.

2nd. Should be under state control through a commission.

3rd. Such commission should have such definite power and authority granted them as may be necessary to protect both the public and corporation.

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STATE SUPERVISION IN MASSACHUSETTS.

FIFTEEN YEARS OF THE GAS COMMISSION.

By Walter S. Allen.

ORIGIN OF PUBLIC CONTROL.

The history of gas companies in Massachusetts prior to 1885 deals principally with unrestrained competition, rate wars, consolidation, over-capitalization, unregulated monopoly and the formation of new companies resulting in the repetition of this vicious circle, until the consumer groaned under his burden; for no matter how expensive the process, in the end the companies saddled the cost upon the consumer by increasing prices or by failing to reduce them as rapidly as the development of the industry would warrant.[1] The companies distrusted the municipal authorities because the latter were always granting franchises to new companies, frequently of a speculative character. The public lost confidence in their officials, because they saw how seldom the city authorities were able to keep the companies within bounds. Soon after 1880, however, gas managers began to appreciate the drift of the industry, to realize that competition was bad for them, that instead of opposing state supervision they ought to favor it, and that some degree of publicity and a state commission to stand between the companies and the consumers would be a low price to pay for a monopoly.

SCOPE OF SYSTEM.

The immediate occasion of the establishment of a commission was the fight between the Boston Company and the Consumers and the Bay State companies. The latter had control of water-gas patents and were striving to get a foothold in Boston. The Boston Company was strongly opposed, of course, and in its eager-

[1] The *Quarterly Journal of Economics* for 1898, 1899 and 1900 contains several valuable articles by Professor John H. Gray which constitute the most thorough and scientific analysis of the Boston Gas Companies yet written.

ness to preserve its control had a bill introduced into the legislature in 1885.[1] This act as finally passed placed the gas companies of the Commonwealth under the supervision of a board of gas commissioners appointed by the governor, to which was given the right to regulate prices and service, and which was authorized to require from the companies full and accurate statements of their business. In return for this obligation put upon the companies, the state granted to the existing companies the right of appeal from the decision of the local authorities to the state board in the event of a second company being granted permission to lay mains in the streets.

As soon as the commission organized and began its investigations, it found that a uniform system of bookkeeping must be established for all the companies, so that their accounts might be comparable. In 1886, at the request of the commission, a law was passed requiring this, and uniform methods of accounting were prescribed by the board. The same act limited issuance of bonds by gas companies to an amount equal to their capital stock, and fixed a maximum rate of interest on the bonds, and forbade leasing without the consent of the legislature.

In 1888 the Commonwealth found gas and electric light companies in active competition with one another, and duplicate electric light plants were being put in by gas companies in the attempt to secure to themselves this field. To bring the whole lighting industry under the control of the state, a law similar in scope to that of 1886, but relating to electric light companies, was passed, and the commission was also authorized to grant to gas companies the right to supply electric light, a power which up to this time belonged to the legislature. With minor changes the laws re-

[1] The system of public control prior to 1885 consisted of state inspection of the quality of the gas, the testing of meters and statutory limitations on prices of gas and capitalization. The method of procedure was through the ordinary civil courts. As Professor Gray says in his article in the August number of the *Quarterly Journal of Economics*, which has appeared since this article was written: "It generally happened in such cases that all the important evidence was in possession of one party, with the burden of proof on the other. The attempt to employ expert witnesses proved comparatively useless; first, because the only men whose knowledge justly entitled them to be called expert were too expensive for the plaintiff to employ as witnesses; second, because such men expected future permanent employment from the companies, and, therefore, would not incur their enmity by testifying; and, third, because, however much knowledge they might possess, it was generally knowledge of a different set of circumstances from those under consideration."

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lating to lighting companies remained the same until 1894, when the so-called anti-stock watering bills were passed. These provide that the gas commissioners shall pass upon and authorize the issuance of all increases of capital stock, and shall fix a price at which such increases may be offered to the stock holders, any stock not so taken being offered to the public at auction.

This brief statement covers the principles laid down by the legislature as to the relationship of the state to the gas and electric light companies. After fifteen years, which have been very stormy years for the gas industry in Massachusetts, it is interesting to see how this method of control has worked.

THE BOSTON COMPANIES.

At the time the act of 1886 was passed, the situation in Boston was already such that the board found itself unable to interfere, and all it could do was to make clear to the consumers and the investing public the exact relationship of the different companies to them and to one another.

In 1884 a company had been organized under the laws of Delaware whose purpose was to hold through a trustee all stocks of the various Boston companies, which had been incorporated under Massachusetts laws, and which were actually supplying gas to consumers. This Bay State Company, while it is the one about which so much is heard, has no standing under the statutes of Massachusetts, and inasmuch as it does not open the streets nor supply gas, it does not come under the control of the state. The stocks of the Boston companies were conveyed to trustees, but each, although with the same officers and offices, continued in the eyes of the law to be an independent company, and with these independent Massachusetts companies the gas commissioners had to deal. Bonds were issued secured by the pledge of the stock of the Massachusetts companies, and stock was issued in the Delaware company and increased at different times until it finally reached extraordinary amounts, this stock being supposed to represent the equities in the Massachusetts stocks over and above the claims of the bonds.

As a result of certain legislative inquiries, an investigation was made in 1892 by the board into the relations existing between the various companies controlled by the Bay State Gas Company

of Delaware, and a special report made at that time showed the existence of evils, which were to a great degree immediately remedied. No legislation, however, was passed at that time.

The following year a resolution was introduced into the legislature by the mayor of Boston, based largely upon the special report of the board and upon the facts disclosed in its annual reports. The agitation then carried on had for its object the securing of a lower price for gas and the elimination of over-capitalization, and incidentally it attempted to destroy the control by a foreign corporation of the Massachusetts companies.

WATER SQUEEZED OUT.

The investigation was called for on the ground that the Massachusetts law fixed the maximum capital of a gas company at $500,000, and that in order to build the works of the Bay State Gas Company of Massachusetts, a bond or obligation of $4,500,000 in addition to this amount was issued to the construction company which built the works. It was claimed that this bond did not represent property, but was simply intended to divert profits to the Bay State Gas Company of Delaware. The legislature appointed an investigating committee, before which the mayor of Boston appeared as prosecuting officer, and a bill reported by this committee was passed which provided that unless this bond, which at that time was the property of the Bay State Gas Company of Delaware, should be cancelled, the charter of the Bay State Gas Company of Massachusetts, should be revoked. It also provided that commissioners should be appointed by the supreme court who should determine the value of the plant of the Bay State Gas Company of Massachusetts, and that the company might then issue stock equal to this value as found. This commission appraised the plant at $2,000,000, and the stock was issued to this amount and the bond cancelled.

CAPITAL INCREASED BY RATE WAR.

While the investigation was going on, the Brookline Gas-Light Company, which was operating in one of the suburbs, was given a contract for street lighting, and was allowed to cover nearly the whole of Boston with a duplicate set of mains. A bitter war for business followed, finally resulting, after the addition of some $4,000,000 to the actual invested capital, in a compromise and vir-

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tual consolidation, although the companies preserve their identity.

It was early recognized by the gas commissioners that if possible this duplication of plant and waste of capital should be prevented, and the attorney-general was requested to begin proceedings to stop it; but he declined to do so, and there was no way open to the board, except through the attorney-general, by which to bring the matter into court.

In 1895, at the request of the legislature, a special report was made on the expenditures of the Brookline Gas-Light Company, and various items which had been charged to construction were shown by the commissioners to be properly chargeable to current expenses, and therefore should not be allowed to stand as capital. The next year this report was revised on petition of the company, which succeeded in proving that certain of the charges disallowed by the commission were legitimately construction expenses and might properly be capitalized.

CONTROL EVADED.

In 1897 another company came into the field by virtue of a special act of the legislature, concerning which of course the commissioners had nothing to say. This was the Massachusetts Pipe Line Company, organized merely to be a distributing company. Behind it was the New England Gas and Coke Company, a voluntary association organized for the purpose of evading so far as possible the laws of Massachusetts in relation to capitalization, publicity of accounts, etc., and this company was to supply gas to the Pipe Line Company, which in turn was to sell it to the various companies in the Boston district. As the result of the various fights and compromises, most of the stock of a number of these companies became the property of the promoters of the Gas and Coke Company, and was in turn deposited with a trust company as the basis for bonds issued by the Gas and Coke Company. In 1897 the commissioners called attention to evasions of law on the part of the Pipe Line Company, and at the request of the legislature made a special report on the comparative cost of coal and water gas, and the possibility of changing the supply in Boston from water gas to coal gas. In 1898 a report was also made on the consolidation of the various companies in Boston under Massachusetts law, and drafts of bills were submitted, but nothing was done by the legislature in this connection. The New England Gas

and Coke Company and the Massachusetts Pipe Line Company declined to make returns to the board on the ground that they were not obliged to, and the matter was reported to the attorney-general, who held that so long as the Gas and Coke Company did not actually engage in the business of supplying gas no reports were required.

The situation then in Boston is this: The stocks of the Boston, Roxbury, South Boston and Bay State Companies, all Massachusetts companies, are deposited with a trust company to secure the issue of the Boston United Gas Bonds, made by the Bay State Gas Company of New Jersey, a company whose stock was owned entirely by the Bay State Gas Company of Delaware, thus bringing any equities in the Boston stocks into the hands of the Delaware company. The stocks of the Brookline, Jamaica Plain, Dorchester and Massachusetts Pipe Line Companies are, with other securities, patent licenses, etc., deposited with a trust company to secure the New England Gas and Coke Company's bonds. The various companies in Boston are working together in harmony, competition having ceased in 1896.

The New England Gas and Coke Company is at the present time engaged in making coke, and sells to the Massachusetts Pipe Line Company a certain amount of the gas which is made as a by-product, and in turn the Pipe Line Company sells to the Brookline and Jamaica Plain companies this gas, and proposes soon to supply other companies in the Boston district.

HAVERHILL GAS CASE.

In 1899 an attempt was made to repeat the procedure of the Bay State Gas Company of Delaware and the New England Gas and Coke Company, and to issue securities based on the stock of Massachusetts companies. This was accomplished in the face of the fact that the law prohibits the issue of such stocks by a foreign company under penalty of a forfeiture of the Massachusetts companies' charters, and was done by incorporating a Massachusetts company under the general laws for the purpose of doing a brokerage business and holding securities. This company, known as the Haverhill Gas Securities Company, bought the stock of the Haverhill Gas Light Company, and issued its own stock and bonds. The matter was brought before the commissioners, on a petition to reduce the price of gas, and the profits of the local company were re-

duced by an order making a reduction large enough probably seriously to hamper the success of this scheme although leaving enough profit for the actual capital invested. The board also recommends in its report of this year that the legislature repeal the charter of the Securities company.

WATERING OF STOCK PREVENTED.

In 1888, in its annual report and in several of the decisions reducing the price of gas, the board called attention to the evils of watered stock, and in 1894 a law was passed prohibiting the issuance of stock by gas and electric light companies without the consent of the board. Under this law in the last six years, eighty-five cases have been acted upon, and while but very few applications have been rejected entirely, in a great many cases the amount of capital asked for has been scaled down. The security given by this statute, that capital stock shall represent actual property, has enhanced the value of Massachusetts gas and electric light stocks in the eyes of investors, and during this last year a company whose plant is located in Iowa has taken out a Massachusetts charter, and applied to the gas commissioners for the authorization of capital, stating frankly that this was for the purpose of assuring investors that the stock represented actual property.

CONTROL OVER PRICES.

The law provides no way by which the gas commissioners shall take the first steps towards investigating the price of gas in any place and ordering a reduction, the assumption being that the provision in the law that twenty consumers or the mayor of a city may petition for such reduction is a sufficient protection to the public, inasmuch as a grievance must be very slight which will not bring a case before the board in one of these ways.

Acting under the powers to reduce the price of gas, the commission has in eighteen cases reduced the price on petition, and in one case has declined to do so. In four cases the prices were voluntarily reduced before a hearing was held, and the petitioners withdrew, and in five cases the price of electric light has been reduced on petition.

The agitation for lower prices in Boston led the commission to make several rulings reducing the price, until in 1893 a price of one dollar was reached for the Boston Gas-Light Company, and

this rate has since been extended either voluntarily or at the recommendation of the commission to nearly all companies supplying Boston.

In 1894 a special report was requested by the legislature as to the effect of the reduction of the price of gas the previous year in Boston, the usual complaint having been made that with the reduction of price, pressures had been increased and that meters were incorrect, and therefore bills were as large as before the reduction. This report, which was very full, showed the incorrectness of all these statements.

HOW PRICES ARE FIXED.

The general principles adopted in fixing prices are as follows: A company having a monopoly is entitled to charge only what is necessary under efficient and progressive management to pay a moderate rate of profit on the present value of the undertaking—cost less depreciation. A surplus accumulated out of earnings belongs *legally* to the shareholders, but the consumers are entitled to share it. In case the company has tried to evade the law as to watered stock or capitalization of surplus, the commission not infrequently punishes it by reducing prices so low as not to pay a fair rate of dividend on the *nominal* stock value. This is just, for the real value is the only true and correct basis. A few quotations from the reports will suffice to show the general trend.

The burdens of reckless management belong to the corporation, and not to the public.

The profits of companies supplying this kind of public service must compare favorably with those which a new company might need to pay a fair dividend, when fully equipped to render the same service.[1]

The ordinary demands which a progressive management desires and is bound to meet may fairly be provided out of incomes, when the price of gas is not made so high as to be burdensome.[2]

This surplus must, we believe, be regarded as the combined result of a wise corporate management and the contributions on the part of the public. It would seem that the company is under obligation to so use a surplus of this character that substantial advantages may accrue from it to the public, and such a course will bring added strength to the corporation itself.[3]

If by reason of superior skill management, or by the existence of a common control in companies supplying contiguous territories, special economies become available, while the corporation which secures these results is entitled to a liberal reward, the public should also receive, as a matter of sound business policy, some share in the benefits thus made possible.[4]

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[1] Eleventh Annual Report, p. 14

[2] Ninth Annual Report, p. 11.

[3] Tenth Annual Report, pp. 31.

[4] Ninth Annual Report, p. 18.

The commissioners' decisions, taken together and viewed from a non-partisan standpoint, will be found to follow very nearly a middle ground between the rights of the consumers and the rights of the companies; but as is usual in such cases, neither side has been satisfied, and there has been a constant agitation in the legislature to harass the board and the companies. This led in 1894 to the passage of a law prohibiting the members of the commission from carrying on any other business, a provision which does not apply to any other board in the Commonwealth, and this prohibtion was unaccompanied by any increase in salary, although later the salaries of each of the members was increased by $1,000 a year.

EDUCATIONAL VALUE OF COMMISSION.

During these fifteen years a large number of special reports have been made to the legislature from time to time at its request, and besides those which have already been mentioned there was a special report on electric meters in 1895, one on accidents in 1897, and the same year one on the explosion in the subway in Boston.

In 1880 a law was passed limiting the amount of carbonic oxide in illuminating gas to ten per cent. This low limit prevented the use of water gas, and rendered companies using it subject to a fine when the gas was found to contain more than ten per cent. A long agitation followed, and in 1888 the law was so modified that the gas commissioners might grant permits to gas companies to use gas containing a higher percentage than ten, but the law was worded in such a way that the commissioners did not see their way clear towards granting any such permit and they so reported to the legislature. In 1889 they made an elaborate report on the comparative cost of water gas and coal gas, and the relative danger to life of the two gases. This was followed the next year by a repeal of the ten per cent carbonic oxide clause, and since 1890 the manufacture of water gas has become general.

The commissioners have called the attention of the legislature to the doubtful legality of foreign companies holding franchises in the streets in Massachusetts, and although nothing has been done towards defining the rights of foreign companies in the streets, all of the foreign companies which held franchises have been converted into Massachusetts corporations.

The law of 1887 allowed the commissioners to authorize gas companies to furnish electric light, and within the next four years

this authorization was granted to twenty companies and one company was refused the right. This last case occurred in one of the larger cities of the Commonwealth, where both the gas and electric light company were doing a profitable business, and where the competition of one with the other was no injury to either company, and it was not considered advisable, although both companies asked for it, that this consolidation should be allowed.

Under the law which gave a right of appeal to the board by the established company against a new company, twenty two appeals have been taken from the decision of local authorities, and in each case the existing company has been granted the monopoly. Since 1895 no such case has come before the board.

The feature in the law providing for the compulsory supply of gas or electric light on an order from the board, has in only a few cases been used to the extent of the issuance of an order, but a great many cases brought before the board have been settled by its mediation. The law passed in 1891 in relation to the ownership and operation of lightning plants by municipalities required the commissioners to collect returns from these towns in the same way as they do from companies, and to prescribe uniform bookkeeping methods for them. It also provided that in the event of a town being desirous of selling light, it has been allowed. A second petition from the town which is already selling gas at less than cost, requesting to be allowed to sell at a still lower rate, has been refused on the ground that the plant was not to be run entirely in the interests of the consumers, but in the interests of the taxpayers at large.

DEFECTS IN THE SYSTEM.

The powers of the gas commissioners over voluntary associations and foreign companies is, by the statutes, limited to their relations with the consumers, and the size of the capitalization and those doings of the corporation which do not directly influence these relations are beyond their control, and the legislature has yet taken no steps towards restraining these voluntary associations, which are corporations in everything but name. The attention of the legislature has been repeatedly called to the condition of affairs in Boston, and to the evils of watered stock and over-capitalization, beginning with the very first report of the board made in 1886, and continuing up to the present time, and much of the law of 1894

was based on the statements made by it. A remedy is badly needed.

The law requires that all violations of law should be reported to the attorney-general for action, and this has been done a great many times. In most cases it was possible for the attorney-general to secure compliance with the law without actual application to the courts, but the law in relation to the power of the commissioners to over-rule the permits of a local authority in allowing the running of wires over streets was decided in the supreme court, and the commission law upheld. In two cases illegal issue of stock in the form of a stock dividend was stopped, and in another case an attempt to evade the prohibition of stock dividends by the issuance of interest bearing scrip was stopped. A great many companies have been reported for violation of the laws in relation to quality of gas, and for minor matters, and one was reported for making incorrect returns.

Recommendations made repeatedly by the commission allowing them to prescribe forms of keeping manufacturing accounts in the same way as they prescribed forms of bookkeeping under the first statutes, have been ignored by the legislature.

SUMMARY OF EXPERIENCE.

Taking the work of the board all in all, and viewing it judicially, it must be admitted that its general effect has been in the interests of the consumers. It is generally felt by the companies that on matters of price it has too little regard for the investors and is too favorably inclined towards the consumers; and it has been for the interest of agitators for municipal ownership and operation to seek to convey the impression that the board has been unduly favorable to companies.

Certain principles have undoubtedly been established by this Massachusetts form of control :

1. That it is essential to a proper control of the business that accounts should be kept in a uniform way, and that a certain amount of publicity, not so much as is desired by the agitators, but sufficient to show the standing of the companies, should be given, and this has been done in the annual reports.

2. That where one company is giving reasonably good service, the remedy for any fault in the service is not to be found by the

admission of another company, but rather by regulation of the price and service of the existing company.

3. That the spirit of the law allows only the issuance of capital for actual property, and in many of the decisions upon applications for additional stock and bond issues made by companies, this principle is clearly and carefully laid down. The same is true in decisions affecting the price of gas and electric light.

4. That it is against the entire spirit of the laws that foreign corporations, domestic corporations or voluntary associations should be allowed, by ownership of the stock of companies under the control of Massachusetts laws, to issue securities without limit.

Much of the feeling that the work of the commission has not been effective in curing evils has been fostered by the condition of affairs in Boston, but this was a condition which the commission found in existence on its organization, and which it was impossible to reach by any act of the board or any new legislation, although it has been hastily assumed by the public and by some of the more radical students of this problem, that it lies within their powers. Added to this difficulty there has been the reluctance of the attorney generals for one reason or another to bring before the courts cases in which there was any doubt as to the powers of the state, so that several of these points which might possibly on judicial determination have been decided to be within the power of the board as representing the state, have never reached final adjudication.

While not in every respect an unqualified success, there can be no question in the mind of any unprejudiced observer that even with the obstacles thrown in its way by promoters who desire greater freedom in the issuance of capital and by agitators who are desirous of securing municipal operation of lighting plants, and even with the political agitation involved in much of the gas question in Boston, the method of control adopted by the Commonwealth of Massachusetts has been distinctly one of advantage to the consumer, and not detrimental to the interests of honestly invested capital.

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GAS LIGHTING IN GREAT BRITAIN.

By Milo Roy Maltbie.

[Note.—The statistical data used in this study have been taken from official sources and in many cases have been verified from personal knowledge. The Board of Trade returns—the most valuable and complete of all official reports upon the subject—give data for both public and private plants, which are distributed as follows:

Scotland	41	municipal and		3	private	plants.[1]
Ireland	7	"	"	9	"	"
England and Wales	174	"	"	427	"	"
Total	222	"	"	439	"	"

The unusually large proportion of public works in Scotland will not disturb our generalizations, for the works are distributed very uniformly over each country and through every class of cities. The only fact to be noted is that a larger percentage of the small cities have private works than of cities of larger size. However, this is counterbalanced by the fact that London's supply is in private hands.

As a check upon conclusions derived from these figures, the writer has taken all the cities over 50,000 in 1891, which are equally divided between public and private ownership, and has prepared separate computations.[2] These 62 plants are distributed according to population—census of 1891—as follows:

Population.	Municipal.	Private.
250,000	5	3
150,000—250,000	5	4
100,000—150,000	4	6
75,000—100,000	5	6
50,000— 75,000	12	12
	31	31

Owing to the fact that 10 out of the 17 towns over 150,000 population have public works, municipal operation has a slight advantage in some lines over private management, but due allowance has been made in all deductions.

Conclusions based upon data from a large number of plants are more apt to be correct, and therefore I have usually given more weight to the returns from the 661 public and private plants than from the 62. In many cases, statistics are given herein for a few years *only*, to avoid an endless array of tables; but in every such instance, the data have been worked out for other years and fully support the conclusions stated.]

[1] There is never more than one plant in a town, except in London; but as municipalities and private companies often supply areas beyond the limits of the boroughs or the town proper, the number of local areas supplied is often greater than the number of plants. Salford, for example, supplies some 20 townships outside of its own boundaries. These areas are usually suburban areas, and thus one may say that there are about 222 *urban centers* having municipal supplies and about 439 having private supplies.

[2] London is omitted because peculiar local conditions make its position anomalous. Rhondda has been dropped from the municipal list and Merthyr Tidfil from the list of private companies, because the plants are so small as not to be representative instances. Leyton—population 63,000—is also not included because it is impossible to differentiate the data for that town.

In all urban centers, the use of gas has become a necessity. The oil lamp, which long served so well, has retired to country homes and small villages; not so much because it is less efficient or more expensive than gas, as because higher standards of living declare it *passé*. Electricity upon the other hand has not been able to displace gas because of its higher cost, especially since the newly invented incandescent burner has so greatly improved the illuminating power of gas. In the homes of the wealthy, electricity will come more and more into use, but unless unforeseen inventions revolutionize the manufacture and supply of electricity, gas must continue to be the illuminant used by the majority of urban dwellers.

The influence of light upon social and economic conditions has often been noted. The affinity between evil deeds and darkness was chronicled long before city officials discovered that one street lamp is as effective as several policemen. The moral tone of a locality increases in direct proportion to the amount of light it has. Even the most vicious neighborhoods can be made more law-abiding by extensive use of gas and electricity.

But more! Tenement-house commissions and social-settlement workers bear testimony that personal appearance deteriorates, that filth increases where light—natural or artificial—is bad. Let in the sun-light, or substitute a chandelier for a single flickering gas jet. The dirt and filth become evident, and the person is very low down in the scale who will not make some improvement. People do not cling to uncleanliness naturally; but what is not seen, is to a large measure non-existent. Glasgow and Edinburgh light the hallways of tenement houses and find it profitable not only from a moral but from a sanitary and social point of view.

Then, too, bad light directly affects the physical condition of the people, especially of those who are engaged in occupations where the eyes are used constantly, to say nothing of the rapid deterioration in physical strength and vigor of children who do not get abundant light.

Gas as fuel is not yet extensively used, but as the price declines, its popularity and use will grow greatly, thus making a cheap supply a more and more important factor in domestic and industrial economy. Here again the poorer classes need most consideration, for fuel is a larger item proportionally in their budgets than in those of wealthier homes.

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The constant growth of urban populations still further emphasizes the importance of a cheap and adequate lighting supply, not merely because the percentage compelled to use artificial light is increased thereby, but also because the *per capita* consumption of gas or artificial light of any sort increases as cities grow in size. In other words, the mere increase in density of population makes it more necessary to use gas and to use more gas. Further, it is well known that all problems of city life become more acute as population concentrates, and so far as a cheaper and better lighting supply aids in their solution, its importance is increased.

These facts make it evident that the question of municipal or private control of the gas supply has not been given undue attention. They point out also that the basis of comparison of the two systems is not only economic but social, and that the problem must be solved by contrasting actual results rather than by *a priori* arguments and theoretical considerations.

Great Britain is the country best suited for such a study; although it is to be remembered that what proves successful in one political atmosphere may not thrive when transplanted to another soil and climate. The superiority of Great Britain as a field of study is due to three facts. *First:* The experience under municipal and private management extends over a long period of years. Even prior to the middle of the century there were several municipal gas works; and by 1882 the number had risen to 148, at present being 222. Private companies, now some 439 in number, have been operating ever since the first of the century. *Second*: The change from private to municipal ownership has taken place gradually, so that one can compare the two systems under almost precisely the same conditions, and by selecting different periods eliminate possibility of error. When comparing municipal and private operation of the same plant, due allowance must be made for the fact that the gas industry constantly improves and consequently that the later system of management has an advantage over that which precedes. *Third:* The number of public and private plants has been for some years so considerable that the aggregate results for each class truly represent the trend of each system. Local peculiarities neutralize one another where there are a large number of works and prevent errors that would arise from comparing only a few. No two are exactly similar, and consequently it has often happened that zealous advocates of municipal or private owner-

ship have often seemingly established their thesis by selecting plants that were in reality so dissimilar as to vitiate all conclusions.

VARIED EXPERIENCE OF BRITISH TOWNS.

Great Britain has tried almost every conceivable method of managing the gas supply. At the very first, the same principles were applied that obtained in other industries—private ownership unrestrained. This soon proved unsatisfactory, and some sort of public control was everywhere inaugurated, appearing of course in some cities much earlier than in others. Gradually this control was elaborated and strengthened. In many instances, public control gave way to public ownership.

The movement for municipal ownership did not become widespread until after the middle of the century, but a few public plants even antedate 1840, *e. g.*, Manchester-1807(?), Greenock-1830, Beverly-1822 and Keighley-1824. Since 1882 (the first year for which complete returns are available), when there were 148 municipal plants out of a total of 500—29.6 per cent—municipalization has been slowly gaining headway. At present 33.9 per cent are municipal; and this percentage would be much larger if the process by which plants are municipalized, was not so difficult and expensive. To understand the prevalent satisfaction with municipal operation, it is necessary briefly to trace its development and to compare results under each system.

I.

PUBLIC CONTROL.

The illuminating power of gas has been known for centuries, but the first British company was incorporated less than a century ago, when it was found that the development of the industry could not proceed without the formation of companies with limited liability. To secure this power, an act of Parliament was necessary.

In 1810, "The [London] Gas Light and Coke Company" was incorporated "for making inflammable air." The Act[1] authorized the Crown to grant corporate powers by charter, limited the stock to £200,000, and expressly withheld the power to borrow money. Gas could not be supplied outside of the "Cities of London or Westminster and the Borough of Southwark." Upon the demand

[1] 50 George III, c. 163.

of any local authority within this area, the company was required to supply for public lighting a stronger and better light and at a cheaper rate than paid for oil. Other restrictions were imposed to prevent fraud, laying of mains without consent of the local authorities and the formation of a monopoly. The charter was to expire in 21 years, but the company's powers from time to time were extended and enlarged.

Although the whale-oil industry feared its new competitor and strongly opposed the formation of gas companies, others were soon started both in London and in provincial towns.[1] Whenever an *incorporated* company was formed, recourse was had to a special act of Parliament; but a number of companies supplied gas without corporate powers, as local authorities were supposed to have power to permit the laying of mains in streets without special authorization by Parliament. This question was finally tested in the courts which decided that a specific grant was necessary. As a result, almost every company was compelled, sooner or later, to secure a special act.

LEGISLATIVE SUPERVISION UNSATISFACTORY.

This system of granting powers by special legislative act developed several objectionable features. The expenses for printing, witnesses, fees and legal representatives often reached many thousands of dollars. The Parliamentary committee to which the bill was referred spent months in preparing a report. More important matters were deprived of the consideration they deserved.

In 1847 the plan was hit upon of passing a "clauses act." Parliamentary committees had come largely to agree upon what should be inserted in company bills; thus many sections were identical. These were incorporated into the "Gas and Water Clauses Act, 1847,"[2] which was made a part of a gas company's bill simply by citing the title. The result was a great decrease in expenses, time consumed in debate and interference with legislative work. Acts which in 1846 contained over 200 clauses were reduced to 40.[3]

[1] According to Richards, "*A Practical Treatise on the Manufacture and Distribution of Coal Gas*, London, 1877, page 30, about 200 works had been constructed 1829.

[2] 10 & 11 Vict., c. 15.

[3] Down to 1885, over 1000 gas bills had passed Parliament, and 60 of these applied to the Metropolis alone. Clifford, *Private Bill Legislation*, 1:221. Most of these were passed before provisional orders came into so general use. See pages 543 and 544.

This Act is of chief interes there because it shows what control had developed and what restrictions had come to be included in the multitudinous special acts up to 1847. It contained many regulations as to the laying of mains, as to the manner, time and place of making gas, as to the prevention of public nuisances, as to injuries to meters and pipes, recovery of rents, etc., and authorized local authorities to issue ordinances safeguarding public interests. But the only direct public control of importance was contained in the clause limiting profits to ten per cent unless otherwise authorized in the special act.[1] If a dividend fell below this maximum, the deficiency could be made up in subsequent years. A reserve fund up to one-tenth of the nominal capital could also be created out of profits, but all profits beyond these amounts had to be used to lower gas charges.

The Act of 1847 was not of universal applicetion, and bills were enacted which did not contain these provisions. But it shows that even at that early date, unrestricted private ownership was considered unwise and had largely been abandoned. During the next twenty years the demand for more rigid public supervision grew stronger, resulting in the passage of the Acts of 1870 and 1871, which with the Act of 1847 constitute the basis of the present system.

PRESENT METHODS OF GRANTING FRANCHISES.

The method of granting corporate powers has been simplified greatly since the early part of this century. There are now Companies Clauses Acts which regulate the formation and operation of joint-stock companies, and the interests of the stockholders as well as of the public are much more carefully safeguarded than with us. To lay mains and operate works in a given locality, the company must secure power either by a provisional order or a special act of Parliament. In the former instance, an application is made to the Board of Trade, which must first ascertain whether the local authorities in whose district the company wishes to operate will give their consent. If they refuse, the Board of Trade may proceed without it, but the reasons for so doing must be reported to Parliament.[2] In practice, the desire of the local authorities is seldom disregarded, and not infrequently they take advantage of

[1] Dividends of gas companies were first restricted in 1841 by a private act. Clifford, 1: 223.

[2] 33 & 34 Vict., c. 70, § 4.

their power to have inserted in the provisional order conditions more or less favorable to the public. The company must submit full and complete plans, and every phase is carefully gone into, final conclusion being reached only after the most thorough examination and the widest opportunity for everyone to be heard. If the Board of Trade decides to issue a provisional order, it is drafted, not by the company or its attorneys, but by the Board itself, which has power to insert or strike out any provisions it desires, not contrary, of course, to existing statutes.[1] A bill is then introduced into Parliament by the Board making the provisional order law; and if unopposed, as is usually the case, it is enacted without further consideration. If opposed, it is referred to a select committee which goes into the whole matter carefully. Its conclusion is usually accepted as final. In most instances the Board of Trade is upheld and very, very infrequently is there any substantial change made in the provisional order.

When the company prefers to proceed by special act, the procedure is different, but the practical results are the same. After the standing orders have been complied with, the bill is referred to a committee, before which the friends and opponents of the measure appear. Everyone is heard, and the most exhaustive inquiry made. The bill is then reported to the House, which adopts without much debate usually the conclusion of the committee. Throughout the entire procedure, the committee, although composed of members of Parliament like our legislative committees, lays aside all party politics and acts more as a judicial body. Although the wisdom of its action is sometimes questioned, not frequently however, its fairness and honesty are never challenged.

The practical results of the two methods do not differ greatly. The Parliamentary committee is more inclined to be lenient with the companies than the Board of Trade, and it is the general feeling that an administrative authority is better suited for the work, except where general policies are to be determined, than a legislative body. But after all, it is the spirit which pervades the system rather than its form which produces such satisfactory results.

GENERAL SCOPE OF SUPERVISION.

At present the local act or the provisional order, as the case may be, limits the area within which gas may be supplied, states

[1] 33 & 34 Vict., c. 70, §§ 5-7.

the purposes of the company, its capital and the conditions upon which shares may be issued, fixes a maximum rate of dividend and the initial figures in the sliding scale, gives orders how any excess shall be used, names the conditions upon which money may be borrowed and the total amount (usually about one-fourth of the capital stock), prescribes the candle power of gas, the pressure and the method of testing, specifies how, when and where directors' meetings shall be held, the qualifications of directors, the method of selection, the powers to be exercised, etc., incorporates the clauses acts relating to the formation of companies, the purchase of land (similar to our power of eminent domain) and the operations of gas companies (the general laws), etc., etc. The grant of power is perpetual; that is, the franchise can be terminated *only* after a special act has been passed by Parliament.[1] No special compensation is paid the central or the local government, the object being to get as good service and as low prices as possible. What the practical results of these provisions are, we shall now see.

LIMITATION OF DIVIDENDS.

The earliest instance of stringent public control over private gas companies was the fixing of a maximum rate of profit. By 1847 it had become quite general although not universal. As the demand for public control grew stronger, it was more and more frequently adopted, and since 1870, when provisional orders were first provided for, very few companies have been given franchises or permitted to increase their capital, that have not been obliged to submit to this supervision. Thus at present, hardly a single company possesses the right to declare unlimited dividends.

In the meantime the maxima have been lowered from ten per cent—the prevailing limit in the first half of the century—to 7½, 7, 6, 5, 4 and even 3½ in one or two instances of most recent date. This is due to several causes. At first, the industry was largely experimental, capital was shy and the average rate of profit in other industries much higher than at present. Ten per cent was considered, therefore, a reasonable limit. When the industry was placed on a firm basis and profits became reasonably certain, capital was more easily secured; and with the decline of the average

[1] Upon this point, gas (and water) franchises differ from electric lighting and street railway franchises. The latter may be terminated by the local authorities at certain specified intervals.

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rate of profit in all industries, ten per cent came to be considered too liberal.[1] Thus, established companies which have been given power to increase their capital stock at different times declare dividends varying from 10 to 4 per cent on different issues, the precise rate often depending upon the date when the stock was issued.

The efficacy of such control depends upon the power over stock issues. This was not fully perceived at first. Parliament had guarded against one method of evasion by prohibiting the payment of the maximum dividend upon stock not fully paid in, but said nothing about converting loans into share capital, or selling new stock to shareholders at a price much below its market value, thus increasing the capital upon which dividends might be declared much beyond the amount actually invested. These loopholes were soon discovered by the companies and made use of. In 1872–3, conversions of loans into stock were prohibited, and about the same time clauses began to appear in special acts and provisional orders requiring that all new capital be sold at public auction. At present, if the stock sells above par, the premiums cannot bear dividends, although the money thus received is invested in the plant and thus increases its earning power.[2]

These restrictions have been in a measure successful—very much so as compared with our free and easy ways of permitting companies to do as they please. But it is extremely difficult to prevent evasion, and experience has developed certain weaknesses that must be guarded against. Capital stock should always be kept equal to the present cost of the plant less depreciation, otherwise dividends are declared on what is practically watered capital. But this is extremely difficult of accomplishment. A construction company, composed of the same persons controlling the operating company, may be organized and given a contract for building the plant at an enormously high figure. The persons interested are not injured by this trick, for what comes out of one pocket goes into the other. The construction company cannot be reached, as

[1] In fixing a limit the central government considers all factors and permits higher profits when the risk is greater. Thus 10 per cent is still a common limit for a small part of the stock while 7 and 5 per cent are the maxims on other portions.

[2] Of course those companies to which powers were granted before the introduction of this rule are not bound by it, but whenever new issues are authorized, this condition is imposed.

there is no limit to its dividends; and the nominal capital of the gas company comes to be much above the actual investment.

Even after the construction period has passed, it is very difficult to keep capital and present value on a par. The plant deteriorates, and if an ample renewal fund is not created to replace worn out machinery and mains, or if capital is not written off, the capital stock soon exceeds real value. Experience has shown that companies very rarely write off capital or provide adequate renewal funds. When new works are needed, more stock is issued, the nominal value being increased by so much. Parliament has tried to prevent this method of evasion. When a bill is introduced for an increase of capital, it strives to apply the economic principle that capital should equal present cost less depreciation, but has not been entirely successful.[1]

A similar difficulty arises when bonds are issued, for if the capital stock is equivalent to the market value of the *plant*, the bonds, being in excess of this amount, are practically watered capital. Parliament now refuses to permit the issue of "debenture stock"—bonds—to exceed in amount one-fourth of the capital stock and limits the rate of interest that may be paid. When all companies are placed upon the same basis, no one is treated unfairly; but if in any way the stock and bonds exceed present value, the maximum rate of dividend is made less restrictive than it seems.

Further, the question of what is a fair profit is a relative one; it depends upon several elements which are very difficult of definite measurement, and which vary greatly from place to place, and from decade to decade. A universal, fixed limit is, therefore, very unfair. The recognition of this fact led to the attempt to obviate the objection by reducing successively the rate from 10 to 4 per cent. However, Parliament has usually lagged so far behind as to give the companies ample freedom. The limits have not greatly restricted them, and the provision permitting them to make up back profits for years when they fell below the legal maximum, no matter how long past, has given them still more leeway.[2]

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[1] *The Report from the Select Committee on Metropolitan Gas Companies*, 1899, calls attention to this difficulty and recommends that obsolete and unproductive capital be redeemed by sinking fund or otherwise.

[2] Firth, *Municipal London*, 1876, p. 357, cities an instance where a London company declared dividends of 40 per cent in 1864 and had a good surplus left over.

Again, if there is no control over expenditures, the law may be evaded by paying high salaries [1] or in other ways charging as expenses of operation what really ought to be included in profits.

The plan is open to the further objection that it tends to retard the introduction of improvements and to check personal effort, unless the limit is so high as to be practically useless. For when the limit of profit has been reached, there is no incentive to introduce new processes. No advantage will acrue; dividends cannot be increased; consequently the plant is allowed to run along as it will, until its deterioration so increases the cost of production as to reduce dividends below the maximum. The very great importance of this factor is more fully appreciated when one remembers that direct competition does not exist; hence all the more need of other incentives. Thus one is caught between the horns of a dilemma; to fix a high limit renders the plan worthless, and to fix a low limit retards progress and injures both the consumer and the public.

One is now led to ask: What benefit *is* derived from the limit upon dividends? Very little where the sliding scale has not been introduced. The purpose of the law is shown by the requirement that when dividends reach the maximum, the price of gas shall be reduced.[2] But from the point of view of the company, there is no advantage in reducing the price of gas. Profits cannot be increased, but expenses are greater owing to increased consumption. And if occasion should arise for restoring prices, the general opposition stirred up would be a troublesome factor. Thus there is every incentive to use up in some way all profits made, and none whatever to reduce prices. Evidently the company is the loser when once the limit is reached, and the consumer gains nothing. This probably accounts for the fact that only in a few instances were prices compulsorily reduced before the introduction of the sliding scale.

MAXIMUM PRICE OF GAS.

The very first act passed by Parliament fixed the maximum price which could be charged for gas for public lighting, but left the private consumer to shift for himself. It was thought

[1] In one case, director's fees were ordered limited to $50,000 annually, the maximum being placed at $30,000. See Firth, *op. cit.*, p. 369.

[2] The company is allowed to accumulate an insurance fund equal to one-tenth of the capital stock from which unusual expenses may be paid, but after that all the surplus must go to reduce prices.

that competition either between different companies or different commodities would prevent unreasonable charges and monopoly prices. The Gas Works Clauses Act of 1847 shows that even by that date maximum prices were not generally fixed in private acts. That the plan had become quite common by 1873 is evidenced by an act of Parliament authorizing a temporary increase of existing maxima, owing to the "unusual increase in the cost of production gas."[1] At present, all companies are subject to some limitations, only eight, according to the return for 1899, being entirely free. Of the remaining 431 companies, 25 have fixed maxima, and 186 are operating under a sliding scale, according to which dividends may be increased when the charge is reduced below a certain price. Nine companies have both a fixed limit and a sliding scale.

The fixed maxima vary from 3s. 4d. per thousand cubic feet, as in the case of Newcastle and Tynemouth, to 10s. 6d. in Sligo, Ireland. Those most common are from 4s. to 6s.

The objections to a fixed maximum price are similar to those urged against limited dividends. The gas industry is a progressive industry; the cost of supplying gas constantly decreases; and a once restrictive limit soon loses its value. Ten shillings was none too high in 1820, perhaps, but in 1900 it is entirely out of range. It becomes necessary, therefore, to reduce the limit to keep pace with new processes and changed conditions.[2] There are only a very few, if any, instances in which any department of the central government outside of Parliament, has this power, and Parliament usually fails to act until a company comes before it asking for further powers or authority to increase its capital. This is a very tardy method of applying a remedy, and it is so difficult to ascertain what would be a fair price that the government usually errs in allowing a too wide margin. The difference between the maxima and the prices actually charged is often considerable, and while in some instances this control may seem to restrict the companies, it usually permits ample freedom and seldom prevents

[1] 36 & 37 Vict., c. 89, § 7.

[2] Mr. Sidney Webb, in *The London Program*, p. 48, says: "The enormous rise in the receipts from the sale of residual products, which do not enter into the sliding scale has greatly increased the shareholders' income. A rate for gas which formerly would have yielded eight or nine per cent now yields thirteen."

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the companies from making generous profits. The acts at first said nothing about meter rents, and the limits upon prices were evaded by charging high rents for meters. This is now prevented by limiting meter rents also.

Due allowance being made for these weaknesses, it must be said that limiting the price of gas is much preferable to *laissez faire*. However, it fails to furnish an adaquate means of control; and the recognition of this fact led to the invention of the sliding scale, which first came into general use in the seventies,[1] and has since largely superseded fixed limits for both charges and profits. Over 40 per cent of the companies are operating under it, and in time the old methods will be displaced entirely. The plan is to fix an initial price of gas and of rate of dividend, and as the price is lowered, to allow the rate to be increased. Recent statutes usually provide that a decline of 1 d. (2 cents) in price gives the company power to declare a dividend of one-fourth of one per cent above the initial rate. The acts vary considerably, of course, as to the initial amounts, those most common are from 4s. to 5s. and from 7 to 10 per cent. Just now there is a strong tendency to reduce both the initial price and the initial rate of profit.

This plan of uniting lower prices with higher dividends is far superior to that of limiting either separately. It has to encounter all the difficulties of keeping capital and present value of plant equal, expenses within proper bounds, and maximum prices and rates of dividends sufficiently low to be efficacious when the rapid development of the industry reduces cost of production, and yet sufficiently expansive to conform to varying conditions. It does, however, avoid one difficulty quite successfully; there is an incentive to progress as rapidly as possible, for progress lowers prices, which permits dividends to be increased.

QUALITY OF GAS.

Whether a given price is reasonable depends very largely upon the quality of the gas, and it is very easy to evade a limit upon price by giving a poor quality. British legislators saw this plainly. Whenever a maximum price was fixed, candle power and pressure were also prescribed. Thus practically all companies must furnish

[1] The first instance of its use was in 1855. The Parliamentary Commission which reported on the Metropolitan Gas Companies in 1859 recommended it, but it was rejected. In 1874 the Board of Trade endorsed the principle, and it became quite common thereafter.

gas of a minimum candle power. These restrictions are not very severe, the usual requirement being 14 or 15 candles, the extreme limits being 10 and 25; but some good is accomplished. It is to be noted, however, that gas experts are not united as to whether high quality and high price are preferable to low quality and low price. Local conditions must determine which combination is better. For example, where large quantities of gas are used as fuel and where there is only one set of mains, low quality and low price will be most beneficial. But where coal is expensive, enriching material cheap and gas is used entirely as an illuminant, high candle power and high price will probably be most advantageous. Now if the restrictions imposed do not conform to local conditions, the highest utility of the industry may be prevented. As a matter of fact, very little harm has been done in this direction.

MINOR REGULATIONS.

Besides the foregoing, there are many other provisions giving the central and local authorities some control. If the works are not begun within one year and fully completed within three years after authority is conferred, the franchise becomes null and void, unless the Board of Trade extends the time.[1] Local authorities appoint inspectors to examine meters, pipes and works, and to test gas.[2] Ordinances are issued regulating the laying of mains, the repaving of streets, the manufacture of gas, etc. Complete returns, showing in detail financial operations, must be sent to the local authorities and the Board of Trade, which specifies their form and the facts to be given.[3] These reports are published annually, and are invaluable to the legislator, the public official and the citizen, making possible just and wise legislation.

PURCHASE OF WORKS.

Indirectly, private companies are somewhat restrained by the fear that general indignation may lead Parliament to authorize compulsory purchase.[4] Having unlimited power, Parliament can

[1] 33 & 34 Vict., c. 70, § 11. [2] 34 & 35 Vict., c. 41, §§ 29 and 30. [3] *Ibid.*, § 35.

[4] This method of control is not nearly so strong in the case of gas companies (and water companies) as of street railways and electric lighting plants where a general law empowers the local authorities to take over the undertakings at certain specified times without waiting for the consent of the companies, paying them the present value of the works exclusive of all franchise values, payment for good-will or prospective profits. This difference is due largely to the fact that the gas (and water) industry had become

do this regardless of whether the acts originally provided for purchase either compulsorily or otherwise, but it seldom exercises its authority, unless there is considerable provocation. It has great respect for vested interests.

In Scotland, the local authorities—the commissioners of police—were given power in 1876 to buy out, whenever they chose, any company "not incorporated by act of Parliament or authorized by provisional order,"[1] a provision which at that time made every company except the Edinburgh company liable to purchase.[2] Since that date very many companies have been bought out; only three private plants now remain, and these have acts of Parliament or provisional orders so that they cannot be reached except through special authorization, as has always been the case—in England, Wales and Ireland. Thus even in Scotland, this control, once quite effective, is no longer applicable.

In most instances, an agreement is reached between the company and the municipality, and the bill passes without much opposition. When the price alone is in dispute, arbitration is resorted to, which is also the method of determining the compensation in case of compulsory purchase. But whether by agreement or arbitration, the town has to pay at least the full market value of the undertaking, including the value of the franchise, good-will and prospective profits, so far as these elements are reflected in market values. This means that franchises *given* to private companies have been retaken only after paying a good round sum. This is the penalty for failing to insert purchase clauses in the grants to private companies and for permitting franchises to run without limit.

Occasionally, the companies have driven a hard bargain by permitting the plant to run down, by allowing nothing for depreciation and by turning every receipt into dividends, thus inflating the market value of the stock. Just before the collapse came, an offer would be made to the municipality to take over the works. The authorities and the public, anxious to secure the advantages reaped by other towns, have swallowed the bait, awak-

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firmly established before the movement for municipalization became so strong. Indeed, it took almost half a century to prove that competition was wasteful and impracticable and nearly thirty years more to demonstrate that municipal operation ought to be made as easy as possible.

[1] 39 & 40 Vict., c. 49, § 20. [2] Silverthorne, p. 11.

ing to find that although the price paid was perhaps very reasonable as compared with the market value of the stock, it was much above the real value, and that an extended system of repairs and reconstruction would soon be necessary.

Prior to 1872, the towns were able to get better terms than at present by threatening to establish competing plants. The private companies considered this unfair and secured the passage of an act prohibiting the payment from public funds of costs of promoting bills to authorize new municipal plants when privately owned plants existed.[1] These legislative expenses are so heavy that the act has put an end to this scheme.[2]

The relative importance of these various methods of securing control of gas undertakings is shown by some figures in Silverthorne's work, *The Purchase of Gas and Water Works*, 1881, pages 32–59. Of the 58 municipal plants concerning which facts are given, 37 were purchased by agreement (probably most of these by local act, as provisional orders had not yet come into general use), 4 were secured by arbitration, 3 by compulsory purchase, 1 "semi-compulsory," 7 through the threat of establishing competing plants and 6 were built originally by the local authorities.

ELIMINATION OF COMPETITION.

The comprehensive system of public control above described was only secured after several decades of experience, in which it became evident that the gas industry tended to become a monopoly, that a monopoly was dangerous to public interests, that it would be beneficial both to the public and to the companies if competition were eliminated and private companies placed under public control.

The history of the London gas companies shows most clearly the bad effects of competition and the way public control dedeveloped, although every provincial town of any size has passed through a similar experience.[3] In the first half of the century, competition was encouraged. Companies were organized which

[1] 35 & 36 Vict., c. 91, § 2—Borough Funds Act.

[2] In 1876 some of the London companies were forced to accept new limitations on dividends by the threat of the City Corporation to establish a competing municipal plant. Webb, *The London Programme*, p. 51.

[3] See Richards *A Practical Treatise on the Manufacture and Distribution of Coal Gas*, from which the following facts are taken.

gridironed the streets and waged relentless war for customers. The streets were constantly torn up for the laying of new or the repairing of old mains; and the pipes were so interwoven that gas was supplied to a consumer by one company, while another collected payment. Moreover, owing to the carelessness of the companies and the secrecy maintained, many firms burned gas for years without paying one shilling. The city was covered with agents, and in their strife for customers, contracts were made often at one-third or one-sixth of the usual rate. The loss by leakage was large and serious accidents sometimes happened. Temporarily many consumers were benefited, but the gas companies were injured. After the war ended, prices were advanced sufficiently to recoup past losses and to pay dividends upon the large amount of capital wasted in the unnecessary duplication of mains. Thus the consumer ultimately paid the cost of the rate war, and his temporary gain was a mere bagatelle to his great permanent loss.

About 1850 several companies, recognizing their folly, divided London south of the Thames into districts, agreed that each should confine its operations to the districts assigned it, and raised prices from 25 to 50 per cent. A similar plan had been tried before. In 1823 the impracticability of competition had partially been seen, and for several years new companies were limited to certain districts. But even this slight movement in the direction of eliminating competition was unsuccessful. The methods of enforcement were weak; public control was not sufficiently strong to protect the consumer, who looked askance at monopoly rights. In 1842 return was made to the competitive principle, companies being authorized to supply areas already supplied. Similarly, in 1851, when the companies had voluntarily districted the city, there was no way of enforcing the agreement. Fearing it would soon be worthless, a bill was introduced into Parliament to enact into law the districting scheme, but the threat of strong opposition killed it.

A few years later, London north of the Thames was districted, and the problem became so urgent that a Parliamentary commission was appointed, made an investigation and recommended in its report that districts be assigned the several companies, that in return for this favor the maximum price of gas be fixed at 4s. 6d., that profits be limited to ten per cent unless the price be reduced, and that a minimum candle power be prescribed.[1] Many

[1] *Sessional Papers*, 1859, Vol. 3.

companies had secured their powers before public control had grown to include these matters, and these objected to the conditions imposed. Parliament refused to grant monopoly rights without strict control, and the companies gave in rather than lose so valuable a privilege. The Act, somewhat modified, was passed in 1860,[1] the metropolis being apportioned among the thirteen companies. Since then this number has been reduced by consolidation to four within the county of London, but boundary lines still exist and actual competition nowhere obtains.

The lesson has been well learned, not only by London but by all provincial towns. To-day there is hardly a person in any British city that has the privilege of obtaining gas from any company other than the one now supplying him. Outside of London, there is only one company in each town, and the creation of a second is never proposed. In other words, there is no more competition between private companies than between municipalities. The price paid for this monopoly was submission to public control, and the bargain has been beneficial to the public and to the companies.

To summarize the results of this policy :

The elimination of competition has enabled the private companies to formulate and carry out a definite and constructive policy. Their securities have risen in value, for the fear of a ruinous rate-war has been reduced ; duplication of plants and mains is no longer necessary. The cost of production has been decreased in other ways, and the profit-producing power of every plant thereby increased.

The public has also benefited. Part of the gain of monopolistic production has gone into the pockets of the consumer. The control over stock issues, dividends, price and quality of gas has prevented, in the main, the abuse of power by the private companies. The capitalized value of a plant is generally considerably more than the present cost of construction less depreciation (not including the franchise), but the difference is by no means so great as would be the case if Parliament were not so careful about authorizing capital outlays, and if the "auction clauses"[2] did not exist. Probably an administrative authority would be able to ascertain much more accurately whether power to issue new stock

[1] 23 & 24 Vict., c. 125.

[2] See page 546 *supra*.

ought to be granted. Current expenditures may be too high in a few instances, but the law is not frequently evaded in this direction. Public control has not retarded the development of the industry, and it is almost as progressive where the sliding scale is not used as where it is, for the limits upon dividends usually allow ample margin. Prices are usually lower under the sliding scale, and the industry more economically conducted. Public control is undoubtedly superior to *laissez faire*. Nevertheless, many towns have gone further and have municipalized their gas works. It is necessary, therefore, to contrast the results under public control and under public operation, and to ascertain which system is preferable.[1]

II.

MUNICIPAL *vs.* PRIVATE OPERATION.

PRICES LOWER UNDER MUNICIPAL OPERATION.

The question of price usually attracts attention first, although it is not the most important factor. The varying scales of prices and discounts make it impossible to determine by direct comparison whether public or private plants charge less. Dividing total receipts by the number of thousand feet of gas sold, during 1898, one gets a quotient of 3s. 6d. (86 cents) in case of private and 3s. ½d. (75 cents) in case of public works. This quotient is not the average price in either instance, for total receipts include receipts from the sale of by-products, rents of meters, stoves and fittings, public lighting, etc. From a close examination of the financial statements, however, I am positive that receipts other than from the sale of gas are practically the same in relative amount, except that a number of towns make no charge for public lighting,[2] and that most towns charge less for meters and fittings than private companies.

[1] One might conceive of municipal *ownership* and private *operation*, but I know of only one such instance—Newbury—cited by Silverthorne, *op. cit.*, p. 56. This system is very difficult of practical adjustment, and most cities that have gone so far as to build a plant advise its operation as well. I have omitted all discussion of the system, as generalizations from one instance are untirely unsafe. Doncaster tried to combine public and private interests in one company, but this was given up in a few years for municipal operation.

[2] Municipal plants supply free of charge 8.5 per cent of all public lamps lighted.

These elements might reduce somewhat the difference of 11 cents in favor of municipal operation, but relatively they are not important. After making due allowance, it is safe to say that municipal gas is sold upon an average 7 or 8 cents less per thousand cubic feet than gas furnished by private companies. This may seem a small difference, but upon a total consumption of 47,283,759,687 cubic feet, it means an annual saving of $3,300,000. Compared with the actual average price of gas—probably about 60 and 70 cents [1]—it is considerable, at least ten per cent of the price. The lowest charge was 1s. 4d. (33 cents) in Widnes, a town of 35,000 people having a municipal plant; the highest was 10s. ($2.50) charged by several private companies.[2]

Meter rents are also unusually low under municipal operation. The difference is not so great in the case of ordinary meters as of prepayment meters, which are more frequently furnished without charge to the poorer classes to encourage the use of gas. During 1898 over one-third of the municipal works furnished meters free of charge; only 18 companies did so—less than 4 per cent. Of the consumers supplied by municipal plants, over 62 per cent had meters free; by private plants, 12 per cent. The same is largely true of fittings and stoves, although the authorities have not gone so far in providing these as in the case of meters.

This policy—for it is a conscious attempt upon the part of the towns to make gas lighting as cheap as possible [3]—does not affect the finances greatly. The receipts are reduced somewhat, it is true, and the expenses are increased, but the great social gain which comes from the much larger number of consumers per 1,000 population where there are municipal plants, more than pays for any loss of profits.

QUALITY OF GAS SUPERIOR.

Whether gas is really cheaper under municipal ownership depends largely upon its quality. But here again the advantage is upon the side of the public plants. In 1898–9 the average candle power of gas furnished by private plants was nearly 16.4; by municipal works nearly 18.9—a difference of 2.5 candles, or 14 per

[1] Upon an average, receipts from the sale of gas are 80 per cent of the total receipts. This would give for municipal and private works an average price of 60 and 69 cents respectively.

[2] *The Gas and Electric Lighting Works Directory and Statistics*, 1899.

[3] In four-fifths of the cases, a maximum price is fixed by law, but it has little effect. The actual price is considerably below the legal maximum.

cent. Leaving out of consideration the Scottish towns, which have an unusually high candle-power gas, the figures are 16.3 and 18 respectively—a difference of over 10 per cent. Although a minimum candle power is prescribed by law for public as well as private plants, the superiority of the former is not due to that cause. The usual minimum is 14 and 15 candle power, but the gas actually supplied is 3 or 4 candle power better.

It is also claimed that the pressure is better and more uniform, but I am unable to verify the statement. It certainly is not inferior. In many other ways the character of the service under municipal operation is most excellent. Many towns have agents constantly explaining to the poorer classes the advantages of prepayment meters, gas stoves, grillers, etc.[1] Show-rooms are often maintained where every kind of gasfitting is on exhibition. Attendants willingly explain every feature, and consumers can readily find without running to many stores the latest improvements, the best stove, heater, burner or what not. This phase of municipal trading has been severely attacked, and undoubtedly there is danger that towns will go too far in this direction, but in most instances the beneficial results more than counterbalance any harm done to the small trader.

EXTENSIVE USE OF GAS.

Probably the most striking difference between private and public ownership is to be seen in the number of consumers. Upon the basis of capitalization, receipts, expenditures, coal carbonized, gas sold, etc., the ratio of private to municipal works is about two to one; yet the number of consumers[2] is practically equal; that is,

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[1] The following circular issued by the gas deparment of Salford is an instance of of how a town is placarded.

GAS COOKING

is the greatest luxury you can have in the house.

You can boil or grill at any hour of the day or night.

No coal to fetch, and no fire to build and light.

Always ready for use—no waste.

If you go out early in the morning, or come in late at night, it is ready to cook you a hot meal, or prepare a hot cup of coffee or tea.

Infants' food can be warmed at any time, day or night. Once used, no home is complete without gas cooking.

[2] "Consumers" do not include of course all persons who use gas, but merely the separate accounts as they stand on the books. Thus a family is a "consumer", just the same as a shopkeeper who has a gas engine is a "consumer."

the per capita consumption of gas under private operation is much greater than under municipal operation, the figures for 1898–9 being 30,000 and 48,000 thousand feet per annum respectively.

This fact does not indicate a disposition upon the part of people in the same social and economic position to use less where the supply is public; indeed, the contrary is true, owing to the cheaper price and better service. What it does indicate is that under municipal operation, a larger number of the poorer classes uses gas. If all the plants were private and conducted upon the same principle as those already in operation, there would be some 730,000 "consumers" less than at present, or estimating five persons to a "consumer," some 3,650,000 persons less. In other words, nearly 25 per cent of the total number of persons now using gas would not be using it were there no municipal plants.

In many towns, practically the entire population is supplied. For instance:

Towns.	Population supplied.[1]	Number of "Consumers."	Ratio of population to "Consumers."[2]
Glasgow	860,000	186,327	4 6
Manchester	655,000	118 958	5.5
Edinburgh	381 000	74.964	5.1
Oldham	220,000	48,174	4.6
Bolton	171 000	37,643	4.5
Halifax	105 000	25,080	4.2
Rochdale	71,401[3]	25 147	2.8
Bury	65,000	11,800	5.5

Comparing the total population with the number of consumers in the 31 towns of over 50,000 population having municipal works with the 31 towns having private plants, one finds:

	Population.	Consumers.	Ratio.
Municipal works	5,528,833	1,115,410	4.9 to 1
Private works	4,752,793	507,169	9.3 to 1

This shows that about one-half the population uses gas where private works exist and practically all the population where there

[1] Except in the case of Rochdale the figures in this column have been taken from *Gas and Electric Lighting Works Directory and Statistics*, 1899.

[2] If "consumers" included only families, one could easily estimate the population actually using gas by multiplying the number of "consumers" by five, there being on an average five persons to each family. But as nearly every meter is counted as a "consumer," and as in some instances a man has a meter at home and another at his store or shop, five is too high. Upon an average, probably four persons to a "consumer" would be a fair estimate. It would depend, however, upon the character of the town. In Rochdale, for example, the ratio is probably less than four, even allowing for a large increase of population since 1891, but Rochdale is a town where small shopkeepers and manufacturers are very numerous. Hence separate accounts are very numerous.

[3] Census of 1891.

are public works. What American city with its boasted superior private management can show such results, even if allowance be made for the more general use of electricity.[1]

This marked advantage of municipal over private operation is not due to mere chance. Prices have intentionally been placed at a low figure; meters, fittings, stoves, grillers, etc. have purposely been offered at low prices or free of charge, and other methods adopted to induce the poorer classes to use gas. Probably one of the most important agencies in this direction is the prepayment meter, for even if fittings and appliances were free, many poor people would find it difficult to accumulate a sufficient amount to pay a month's or a quarter's gas bill. With the prepayment meter they can insert a penny (two cents) in the slot and get from 25 to 35 feet of gas, which will last from five to seven hours.[2] If they do not have the penny, they go without; but according to a peculiar economic law, it is easier to get one penny for each of thirty days than thirty pennies on the thirtieth day.[3]

The importance of the wider use of gas under municipilization can hardly be overestimated. Measure its effect from a social, moral, physical and economic point of view! Estimate the value of a stronger municipal spirit! Who will say that this is not the most valuable asset of municipilization in Great Britain, although it can never be expressed in money terms.

HIGHER WAGES.

The user is not the only person benefited. As a rule, wages are slightly higher and the hours of labor slightly shorter under municipal management, but in neither instance is the difference very noticeable. The principal advantage to the municipal employee is in the way he is treated. Dismissals for trivial offenses are less frequent. Sick and superannuation funds are more often

[1] *The Engineering News* of Jan. 20, 1898, contains statistics for the United States and Canada, but so few Canadian cities are included that the facts practically represent the United States alone. Returns were received from 14 cities having over 100,000 population each showing that 1 person in 12 was a consumer; from 130 cities between 20,000 and 100,000, 1 in 17 was a consumer; and from 230 cities of 20,000 or less, that 1 in 23 was a consumer.

[2] Prices are slightly higher to those who use prepayment meters, but the difference probably does not exceed, if it equals, the added expense of this kind of service.

[3] Manchester in March, 1900, had 31,436 automatic or prepayment meters in use out of a total of 126,191, and in one year had rented 9,560 appliances. Glasgow has over 15,00 toves out on hire.

provided [1], and in a few instances, as at Leicester, special libraries, reading rooms, lectures, entertainments and halls for social gatherings are furnished. The result is a slightly higher labor cost under municipal operation. The difference is not large, and, indeed, cost of production seems to be lower under municipalization than under private management.[2]

One would naturally expect, owing to municipal employment being so desirable, that the spoils idea would be prevalent and the laborers corrupted. Persons *are* eager to secure positions under the town, but as selection is almost always determined by fitness, and as public opinion is strongly opposed to the spoils idea, there has rarely been any prostitution of the service for political or personal ends. Further, there is at present little tendency in this direction. One hears grave fears expressed for the future of municipalization, but even the most pessimistic admit that at present the danger is more imaginary than real. The laborers have not yet exercised the power they possess as voters nor attempted to coerce political parties. Higher wages and better conditions of labor have come as a result of the general feeling that laborers ought to be better treated rather than as a concession to demands made by the workmen themselves. The suggestion is sometimes made that municipal employees be disfranchised. This is a drastic remedy and will not receive much support until the evil becomes more real and until no other remedy seems adequate.

The beneficial result to the municipality of such conditions is that at any time it can secure efficient workmen. A skilled mechanic or an experienced superintendent engages just as willingly to work for a town as for a private company. He knows his position is secure as long as he is efficient, and he is not distrusted

[1] The Birmingham (Gas Department) Sick and Funeral Allowance Society is composed of all the employees of the department, who pay 6d. (12 cents) per week if over 20 years of age, and in case of illness receive medical advice and medicine, and 10s., ($2.50) per week for the first half-year, 5s. per week for the second-half year, and 2s. 6d. per week for the second year of sickness. In case of death £10 ($50) is paid for funeral expenses. When a member is injured at work through no fault of his own full pay is given during sickness. All employees must be members.

The City of Birmingham pays all expenses of the Society, using what is received from members' fees as far as it will go. During 1899–1900, $13,000 were expended.

Besides the funds of this Society, there are pension funds of $115,000 invested in city bonds.

[2] But upon this point see page 569 *infra*.

or disliked because he has worked for a company, or *vice versa*. Not infrequently when an undertaking is purchased, the whole staff is taken over by the town, and the works run on as if no change had been made.

PROFITS.

Coming now to financial considerations, it is first to be noted that the attitude of the municipality towards profits differs greatly from that of the private company. Companies aim to declare as large dividends as possible. Municipalities think more of better service and lower charges than of decreased taxes. Some towns seem even to court a deficit by fixing charges so low that the receipts will barely cover costs of operation, interest, sinking fund and depreciation. But outside of Scotland, where towns are prohibited from using profits "in aid of rates"—to lower taxes[1]—they usually aim to benefit the taxpayers, although the amount is small in most instances.[2]

The present trend of municipalization is setting very strongly away from large profits.[3] When the industry was new, and when public operation was yet something of an experiment, it seemed wise to allow for possible failure, and the amounts carried in aid of rates were considerable, much larger than at present. As it became evident that there was little likelihood of the works ever becoming a burden upon the taxpayers, and as the social value of a cheap gas supply came to be appreciated more, prices were lowered and the margin between receipts and expenditures made smaller; for, they reasoned, if the taxpayer runs no risk of being called upon to meet a deficit, why should he share profits? One may safely predict that "payments in aid of rates" will still further decrease; and before many years, Parliament will probably pass an act requiring that such payments be stopped.

The second important fact is that better service, lower prices, higher quality and more wages have not been secured by incurring

[1] 39 & 40 Vict., c. 49, § 41.

[2] The statement that profits of municipal undertakings are in some instances so large as to make taxation unnecessary is not only false but misrepresents the policy of British towns. Some towns do make a large profit from their gas works, but these are exceptional instances. Manchester in 1899–1900 made a gross profit of over $700,000, and after paying interest and sinking fund charges had $350,000 left, of which $250,000 was paid into the city fund for the general purposes of the city.

[3] The figures for net profits are not given, but gross profits declined from 14.1d (28 cents) per thousand cubic feet in 1883 to 9.2d. (18 cents) in 1898.

a deficit. According to the last return issued by the Board of Trade, the total amount of capital borrowed for municipal gas works was, up to 1899, £28,614,971 ($143,000,000), of which £6,744,715 ($33,700,000) had been repaid or accumulated in sinking funds, leaving an actual capitalization of £21,870,256 ($109,300,000). During 1898–9, the receipts were £7,177,670 ($35,850,000); the expenditures, excluding interest and sinking fund charges but including taxes,[1] £5,365,995 ($26,800,000); and the net profit £1,811,675 ($9,050,000) —or 8.3 per cent. A return issued in 1899 by the Local Government Board shows the same result practically. Eighty-seven municipal boroughs in England and Wales owned gas works with a total *net* indebtedness of £14,720,698 ($73,600,000), and during the five years from 1893–1898 made an average annual gross profit of £1,180,208 ($5,900,000)—or 8 per cent. According to each return there remained to be paid interest at from 3 to 4 per cent, and a sinking fund charge of about 2½ per cent, leaving about 2 per cent to be used to reduce taxes or to establish a reserve fund.

Comparing these figures with those of private companies, as given in the Board of Trade return for 1899, one finds that upon a *share capital*[2] of £44,134,488 ($220,670,000) for all the 439 private companies, a net profit of £3,783,177 ($18,900,000) was made in 1898—8.6 per cent, only slightly more than under municipal operation. As this amount is paid out in dividends, except, perhaps, a very small sum to replace worn-out plant, the average rate of dividend is at least 8 per cent upon the *nominal* capital—about twice the normal rate of interest.

The 62 towns of over 50,000 population show similar results. The average net profit of the 31 municipal works in 1898–9 was 8.9 per cent, with net indebtedness as a base. The 31 private plants made a profit of 7.4 per cent, using share capital as a base.

Taking the amount of gas made as a basis of comparison instead of capitalization, the data for 1898–9 are somewhat different. The profit under public operation was 9.2d. (18.4 cents) per thousand cubic feet; under private operation, 11.3d. (22.6 cents), a

[1] Many writers have made the mistake of assuming that municipal plants do not pay taxes. Such is not the case. Both the central government and the local authorities collect taxes just the same whether the plant is owned by the town or by a private company.

[2] *Loan capital, i.e.*, bonds, is not included, for it does not bear dividends, and the interest paid has already been included in expenditures.

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difference of 2.1d. (4.2 cents) per thousand, due to the higher prices of gas, meters and fittings under private operation.

All this evidence shows that the advantages of municipalization described in the preceding pages have not been secured by piling up an annual deficit. To be absolutely sure of one's ground, and that the day of judgment has not simply been postponed, it is necessary to analyze financial conditions still further. First as to capitalization :

CAPITALIZATION.

Most of the municipal plants were not constructed by the towns but were purchased from private companies, which were paid the market value of the undertaking,[1] including the value of the franchise, except perhaps in a very few instances. As gas works have usually been good-paying properties, the purchase price was much higher than the cost of building the plant, and the original capital investment of the municipality was, therefore, larger than the capital stock and bonds of the private company. To squeeze out the water, to write down the capitalization to a normal figure (the present cost of building the plant less depreciation) usually requires some twenty-five or thirty years, for it must be distributed over a considerable period to lighten the burden. Some of the public plants have not yet reached the proper level, but their excess is more than counterbalanced by those towns that have owned their plants for many years, and that have reduced capitalization below the cost of rebuilding the plant. In 1899 there was a total share capital for private works of 12.34s. ($3.08) per thousand cubic feet of gas made, a net capital[2] for public plants of 8.5s. ($2.12) per thousand. In this connection it should be noted that this difference will probably grow greater instead of less, and consequently interest and sinking fund charges will become less and less important items per thousand cubic feet, permitting the municipalities still further to reduce prices, making the showing in favor of municipalization even more favorable than at present.

[1] As pointed out on page 552 *supra*.

[2] The reader should beware of confusing *net capital* with *capital* value. Net capital means the bonds outstanding less sinking fund—the amount upon which interest is being paid. Capital value is not given in the returns and could not be used therefore, although as a basis of comparison it would be much more scientific than what I have been obliged to adopt.

SINKING FUNDS AND DEPRECIATION.

A more important question is whether through inadequate provision for sinking funds or depreciation charges, the municipal plants have been permitted to run down while fixed charges have remained constant.[1] Let us follow the process and see how the interests of the public are safeguarded in this direction.

Power to purchase or construct gas works must be secured by general act of Parliament, by local act or by provisional order. In any case, unlimited power to incur debt is never given; certain limits are invariably fixed. Sometimes a maximum amount is specified in a local act or a provisional order, to exceed which recourse must be had to Parliament. More frequently there is a general grant of power, subject to the restriction that all loans must be approved by the Local Government Board or some other administrative department of the central government.[2] At first, Parliament was much more lenient than these departments, but of late years it has come more and more to conform to the rule laid down by the Local Government Board, viz., that a loan must be repaid before a new loan for the identical purpose will become necessary. Thus, whether by general law, local act or provisional order, the same result is generally secured.

To illustrate: A town wishes to negotiate a loan for a new gasometer. The Local Government Board knows from past experience about how long a gasometer such as planned will last, and making allowance for depreciation due to new inventions, fixes a term—20 years say—within which all bonds issued for this purpose must be paid; and not until the town has made secure and ample provision for a sinking fund to pay them in 20 years will the Board approve the issue, without which approval they are illegal. If the proceeds are to be used to purchase land, the period

[1] The importance of a sinking fund founded upon a correct principle can hardly be overestimated, for if there is no sinking fund or depreciation account or if the term is longer than the life of the material or the apparatus for which the expenditure was made, the future consumer, or the taxpayer in case a deficit occurs and is defrayed by taxation, pays for something he never enjoys. If, for example, the bonds for a gasometer and the sinking fund to pay off these bonds, are allowed to run 50 years, and if the average life of a gasometer is 25 years, the present consumer would get his gas at less than cost, assuming that charges are based on cost of production. But the consumer a generation hence would be obliged to pay not only the interest and sinking fund charge on the bonds issued to purchase the gasometer then in use but on those issued for the one now torn down and in the junk-shop—a sum double the proper amount.

[2] See 39 & 40 Vict., c. 49, § 18; 38 & 39 Vict., c. 55, § 162—general acts.

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is longer, usually about 50 years, for land is always a valuable asset. If a retort is to be built, a short term is fixed. The idea always in mind is that interest and sinking fund charges must terminate with the usefulness of the thing for which the bonds are issued.

This rule is economically sound, and if in actual practice it has been rigidly followed, sinking fund charges have been ample and each generation has been treated fairly. Turning to the reports one finds that such has been the case. In some instances Parliament has let down the bars, but in recent years and in most cases the periods of prepayment have been well within the rule. Indeed, the trend seems to be to make them shorter than necessary, as by so doing the early removal of antiquated machinery and the substitution of new inventions is made possible, thus keeping the plants fully up to date. The period most frequently encountered is 25 or 30 years, and in many cases loans for the purchase of land run no longer.[1] According to the return for 1899, the 87 municipal boroughs owning gas works in England and Wales had paid off, or had sinking funds to pay off when due, 23.5 per cent of the total capital borrowed. The percentage for all public plants in Great Britain and Ireland was 23.6. Considering the short time for which most of the bonds have been outstanding, the showing is very good.

Private companies on the other hand very rarely, if ever, maintain sinking funds or depreciation accounts, or write off capital in any other way. When a new process is introduced, more stock is issued and dividends are declared not only on this stock but on the stock the proceeds of which were used to purchase the old machinery, now of no value and contributing nothing to the income of the works. Under municipal operation, the latter would have been wiped out before the new process was installed, and instead of capital for two plants—the worn-out and the new—there would be bonds outstanding for the latter *only*. This difference will more and more appear the longer municipal and private plants are operated side by side. Unless the companies change their plans they are doomed sooner or later to reach a point when they can not pay a fair dividend or induce new capital to come in.

[1] In Scotland all works purchased of private companies must be paid for in 40 years. 39 & 40 Vict., c. 49, § 40.

Nothing is said in the laws regarding depreciation funds,[1] for if the rule above stated for sinking funds is enforced, there is no need of a depreciation account. The sinking fund is all the depreciation fund needed. To be doubly secure, however, some of the towns set aside a small fund in prosperous years so that in case it seems wise to rebuild or substitute new machinery before there is real need, it can be done without increasing capitalization. The amount is small and hardly worth considering in most instances.

The requirement that loans must be approved by the Local Government Board gives this authority considerable control over other financial operations. When an application is made, the Board inquires into the financial status of the town and will not give its approval until it is satisfied that the finances are well managed. If it finds evidence of looseness, it can bring about a change by insisting upon improvement as a condition precedent to the granting of its approval.[2]

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[1] The only exception is the Burghs Gas Supply (Scotland) Act, 39 & 40 Vict., c. 49, § 41, which merely mentions depreciation and renewal funds and states that they shall be such as to keep the plants under public control in perpetuity.

[2] It is to be noted that in the preceding discussion of financial conditions, nothing has been said regarding the steadily increasing local indebtedness. Zealous advocates of private interests are wont to make a great deal of this fact and to point out in agonizing sentences the dire consequences. They say, and truthfully too, that between 1875 and 1898, the national debt was *reduced* $650,000,000, and the local debt *increased* $850,000,000, the latter reaching the enormous figure of $1,260,000,000. This they use as a text for an attack against municipal operation, trying to make persons believe that the local governments are in the slough of bankruptcy and repudiation. *But debt is no evidence in itself of bad financial conditions*, and an anaylsis of local indebtedness shows the attack to be groundless. Of the entire amount, 19 per cent is for water works, 13 for wharves, docks and harbor improvements, 16 for gas works, electric lighting plants, markets, dwellings, cemeteries, tramways and baths, which are not a burden in any sense, but instead produce a revenue after paying all expenses; that is, almost 50 per cent of the debt is for paying properties. Probably 40 per cent more is for property which could be sold any time for more than the face of the bonds outstanding, *e. g.*, school sites and buildings, parks and open spaces, public lands and buildings, bridges and ferries, etc. One may safely say that less than 15 per cent of the local debt represents liabilities rather than assets. In comparison the national debt will not bear analysis.

Comparing present conditions with those of 1875, the charge becomes still more ridiculous. Less of the local debt now represents unproductive investments, and by municipalizing monopolies, the financial conditions of the towns have become better instead of worse, to say nothing of the social and economic benefits conferred upon their citizens.

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RELATIVE PRODUCTIVITY.

Up to this point municipalization has been tested by standards that are individual rather than social, standards that have to do with the distribution rather than the production of wealth. The discussion would be incomplete, therefore, if we did not ascertain whether municipal or private operation adds more to the sum total of wealth.

Much has already been written which throws light upon this question. Labor is slightly more expensive per unit of product under municipal operation. I cannot find that there is great difference on this score, but wages are higher, hours of labor less, and as a rule public employees do not seem to work as effectively as private employees. Thus municipalization must be debited to a small amount of economic waste. One must take care not to overestimate its importance, for so far as increased cost is due to shorter hours and higher wages, the resulting loss is offset by an increase in social welfare, which is perhaps worth all it costs. This is therefore not a real loss to society although an economic loss, but merely a conversion of wealth into welfare. The only real loss is due to greater shiftlessness, lack of close application to work and waste of materials.

All grades of employees are not equally guilty. The higher officials and town councilors, in spite of the fact that pecuniary remuneration is not so large under municipal operation, are almost invariably as efficient as the managers and directors of private companies. If success is achieved, popular approval is so marked and social standing is so high as to counterbalance the loss in salary. Tenure is permanent, and town councilors are re-elected term after term, which make possible the formation of a consistent policy covering a long period. There is, however, a tendency upon the part of the managers and the town councils to make as good a financial showing as possible, and consequently old machinery is sometimes not displaced as soon as by private companies.

Statistical data upon these points are very hard to get. Comparing the amount of gas made with the number of tons of coal used, one finds that in 1898–9 the public plants produced 10,534 cubic feet of gas for every ton of coal carbonized (2240 lbs.), the private plants 10,894 cubic feet. But these figures are worth little, for many plants use enrichers, and unless the amounts are rela-

tively equal, the results would not be comparable. Whether such is the case, it is impossible to say. Taking the gas wasted as a test, the returns for 1898–9 show that in public plants 8.07 per cent of the total amount made is unaccounted for; in the private plants 7.64 per cent, which would indicate a very slight advantage for private operation. Cost of production sends the pendulum to the other side. Dividing expenditures by the amount of gas made, one learns that a thousand cubic feet of gas costs upon an average 25d. under municipal operation and 28.5d. under private operation —a difference of 3.5d. This is not due to a lower rate of interest, for interest is not included in expenditures in either instances, except in the case of bonds or debenture stock issued by private companies. But as the total amount of loan capital is only £9,360,000, the interest annually paid would not be more than £468,000 at 5 per cent—an unusually high rate—or 1.3d. per 1,000 cubic feet of gas. There yet remains at least 2.2d. per 1,000—a very good showing for the municipal plants.[1]

If productivity *is* less under municipal operation, a fact not substantiated by the statistics at command, the difference is very small indeed and certainly more than counterbalanced by the greater social welfare that attends a fairer distribution of wealth, and the social benefits of a cheap supply of artificial light.

PROGRESS UNDER MUNICIPAL OPERATION.

What is even more important than a comparison of cross sections at any one moment is a study from the view point of rapidity of growth: Which system is more favorable to progress? Under which method of control does the industry move forward more rapidly? This is the nub of the whole matter, the most important element, for if municipal operation retards progress, its present advantages may soon be wiped out. Return must then be had to private operation or the gas industry will stagnate, bringing in its trail all the evil effects attendant upon an expensive and inadequate lighting supply.

[1] Since this was written Mr. A. E. Forstall, secretary of the American Gas Light Association, has suggested that municipal plants may pay less for their coal than private plants, and that as gas would therefore cost less, the towns could sell it for less and still make a larger profit than could private companies. There are no statistics at hand whereby one can test this statement, but it is my impression that the difference in cost of coal is very slight and that it does not fully account for the excellent financial condition of municipal plants.

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First, as to relative decrease in price. Dividing receipts by total amount of gas sold in 1887–8 (the earliest year for which the facts are given), we get the quotients 3.28s. and 3.71s. for public and private plants respectively. Comparing these with the figures for 1898–9 (3.04s. and 3.46s. respectively),[1] we find that prices have decreased some 7.3 per cent and 6.7 per cent—very slight apparent advantage for municipal operation. If it were possible to get the figures for the fifties or the sixties, prices under private operation would probably show a greater decline than under municipal management, because in the earlier years prices were very high. This marked decline came after the wide introduction of municipal ownership in the sixties and seventies and was due very largely to the frequent comparisons made between public and private plants and the evidently cheaper supply from the former. Private plants had been non-competitive in a sense, for even in the sixties there was seldom more than one company in a town; and the aim of all being the largest possible dividends, there was no rivalry as to reduction of prices between companies. When a municipal plant began operation in a town close by another having a privately owned plant, comparison was at once made. If the municipal plant offered gas at a lower rate, the citizens in the neighboring towns were apt to agitate for the municipalization of their supply. To smother this agitation prices were often reduced before they would have been if no municipal plant had been close at hand for comparison. Beginning at a higher level, the companies could of course decrease prices by a large percentage and yet remain, as at present, somewhat above the level of municipal plants. This reduction should possibly be included as one of the advantages of municipal operation.

The data as regards waste show a different result. In the three years from 1882 to 1884 inclusive (the first years for which returns are given), the average annual percentage of gas unaccounted for was 8.94 for public and 8.29 for private works. In the three years from 1896 to 1898 the average annual loss was 8.33 and 7.64 per cent respectively—a decrease in 14 years of 6.8 and 7.8 per cent. Evidently, the local authorities are not quite so progressive in this direction as the companies. Although the difference is not great, there is here a tendency which must be guarded against.

Comparing the number of tons of coal carbonized with the

[1] See page 556 *supra*.

amount of gas made for the same three-year periods, one finds that in 1882–4 the municipal plants yielded 9,908 cubic feet of gas to every ton of coal; in 1896–8, 10,397 cubic feet—an increase of 4.9 per cent. The private works extracted 10,098 cubic feet in 1882–4 and 10,624 in 1896–8—an increase of 5.2 per cent. These figures are practically worthless, for they take no account of the large quantities of enriching material used and of water gas which has lately grown in popularity with managers.

A far more accurate standard is cost of production, obtained by dividing expenditures by amount of gas made. In the three years, 1887–9 the average cost under municipal management was 25.4d. per 1,000 cubic feet; from 1896–8, 25.2d.—a *decrease* of nearly .8 per cent. For the same periods, the average cost under private ownership was 27.9d. and 28.5d. respectively—an *increase* of over 2 per cent. This evidence is negative rather than positive in character. While the margin is too small to permit of much generalization, it does tend to show that municipal ownership is not less progressive than private management.

All in all, municipal operation seems to be as progressive as private management, at least there is no marked difference in either direction as far as methods of manufacture and management of works are concerned. When it comes to a consideration of public welfare, to extensions of service and increased facilities for the use of gas, municipalities set the pace; they lead rather than follow.

RÉSUMÉ.

Summarizing the results of municipal ownership as compared with private operation under public control, it is to be said that under the former system, prices for gas, meters and fittings are lower, that the quality of gas is better, that it is much more extensively used, that wages are higher, that the treatment of laborers is better, that profits are nearly as large, that works are not as highly capitalized, that sinking funds are adequate, that productivity per unit of raw material is almost as great and that the management is fully as progressive. All in all, then municipal operation has been more successful than private operation.

It is exceedingly fortunate that municipal and private operation has been carried on side by side, as each stimulates the other and as comparisons are certain to be made, always to the ultimate benefit of the less progressive plant. The private plants

doubtless give better service and lower prices than they would if no public plants existed. On the other hand, municipal authorities are spurred on by the competition of private companies for ublic favor.

IS SUCCESS PERMANENT?

To the American student it is important to know the causes of this success, how it has been attained. There is no secret power in municipalization. It is not the fountain of youth for decrepit city governments in which they need but to bathe and then come forth every whit whole. Successful municipal operation (and efficient government in every respect) can be achieved only by securing efficient men as managers. This the British towns are able to do. They pay good salaries. The social standing of all officials is very high—a great inducement to many men who do not value an income of $50,000 much above one of $15,000 if only a higher social standing goes with the latter. The spoils system does not permeate every department destroying efficiency, integrity and self-respect. An *esprit de corps* obtains which inspires one to faithful service and severely condemns the listless and the slothful.

Not only has politics—so-called—been kept out of the municipal service, but the employees have kept out of politics. Labor organizations have seldom attempted to dictate to town councils or to gas managers, either as to wages or the introduction of new machinery. The authorities have been very generous to the employees, and the employees have refused to put in jeopardy their own welfare as well as the success of municipal operation by demanding greatly advanced wages or by opposing the adoption of improved processes. They have recognized the great gain to society from the immediate adoption of new inventions, and have not hindered progress by untimely opposition. While the labor organizations and their leaders should be given considerable credit for adopting so wise a course, public opinion would hardly tolerate such interference if it were proposed.

Another element is the good-natured rivalry between municipalities. It is the competitive idea in a new form. Comparisons are constantly made between municipal plants. If prices are higher than elsewhere or service inferior, the public comes to know it. The council and its officers are called to account at the next election. Where the social odium which attaches to mismanage-

ment is so great and the popular esteem attendant upon efficient management is so marked as in Great Britain, public opinion is very powerful, taking the place to a considerable degree of prospective dividends and profits as an energizing force to make men do their best.

There is a class of men also who seem to get a great amount of satisfaction from work well done simply because they know that it is well done. Its membership is not large to be sure, but where there is public recognition of efficient service, many able men find in the two forms of compensation as great a stimulus as produced by the large salaries or profits which are their reward under private management. Indeed, one reason why so many men of ability go into business instead of governmental service in the United States is not because great wealth satisfies their wants but because the social position and popular esteem accorded to men of great wealth is so much higher and greater than accorded to politicians. It is not the only cause, but it is an important element. In Great Britain, the position is reversed, and hence public service has the greater relative attraction.

Whether municipal gas works are likely to continue to be so efficiently and economically administered, depends largely upon the permanence of these elements. If they are preserved and strengthened, if the attruistic tendency continues to grow stronger, there is no reason why municipal operation may not grow in efficiency. But if public service becomes degrading, municipalization must deteriorate and become a bye-word. The prospect of larger profits will predominate carrying private management to the fore.

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MUNICIPAL GAS AND ELECTRICITY IN A TYPICAL GERMAN CITY—HALLE A/S.

By Edmund J. James.

Owing to the great difference in the economic, social and local conditions prevailing among the various German cities, it is not altogether safe to select any one municipality and represent it as in all respects typical of other communities in Germany. The form of government, the tastes and ideas of the people, differ so greatly in the different portions of the German Empire, that what may be true of one portion or of one state is not necessarily or even probably true of another portion or another state. What is true of small cities may not of course be equally true of large cities and vice versa. What is true of cities in the south of Germany may not be true of cities in the north of Germany and vice versa. It is therefore impossible to take any one community and say it may be considered in all respects as a sample and that what is true of its relation toward such matters as the supply of water, gas and electricity, is true, even in a general way, of other cities.

At the same time, it is true that there is a general course of development characteristic of the cities in the present German Empire as a whole. Some of them are at the beginning of this development; others are fairly started upon this course; and others have reached a period of high development; and, with the reservation noted above, it is possible perhaps to select a community which shall show in its own history, to a certain extent at any rate, the direction of development of German communities as a whole. For such a purpose it is desirable to select a medium sized city, a city which is growing rapidly, a city which is trying to adapt itself to modern conditions to the fullest extent and which represents, therefore, what may be called the progressive tendencies in German municipal life. Perhaps no better example could be chosen to serve our purpose than the city of Halle on the Saale. This is one of the most ancient cities in Germany and at the

same time one of the most modern. It is a city which has grown steadily, and at times rapidly since the latter part of the forties, from a community of perhaps 30,000 souls to one exceeding 150,000. It has become a great railroad and industrial center. It has been compelled to incur large expenses to adapt the older portions of the town, which date from the sixteenth and seventeenth centuries, to the needs and conditions of modern life, and at the same time has had to provide for the care of an ever increasing population and of a population which on the whole has made ever more imperative demands for modern improvements. It may represent in a certain way, therefore, the tendencies at work in all modern German cities. Before describing the experience of the city with the supply of gas and electricity, a glance at what I conceive to be the general tendency in modern Germany in this respect may not be out of place.

THE TREND TOWARD MUNICIPALIZATION.

Regeneration of the German city dates from the fifties of this century. It was then that, owing to the growth of cities and to the general industrial, political and social development of Germany, a new and more imperative demand for extended and better supplies of certain necessities of life revealed itself in nearly all progressive communities alike. Thus, the cities were compelled to provide, generally speaking, for a more adequate and a more satisfactory supply of water, due partly to an increase in population and partly to a higher social standard as to what adequacy and quality in this respect consisted in.

To provide this new water supply, however, it was necessary to make large expenditures—much larger than could be provided for out of the current income or current taxes of these communities. The municipal financial system had not been so fully developed that it was easy to borrow money at low rates for this purpose, and consequently very many of the German cities were compelled to entrust the provision of this necessity of life to the management and control of private companies. It was no uncommon thing, therefore, to find German cities conferring extensive privileges upon private water companies—privileges which in many instances have but just begun to expire. In nearly all cases, the cities reserved to themselves the right, under certain conditions, of taking over the water supply upon payment of certain sums to the

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private companies. The experience of the cities with these private companies was on the whole so unsatisfactory that those which had taken up with this method in the forties and fifties soon made strenuous efforts to get rid of the private system and replace it by public construction, ownership and management. The cities which in the sixties and seventies took up the question for the first time decided in most cases in favor of public water works. As a consequence, to-day nearly all German cities own and manage their own water works. Private companies exist only under exceptional conditions—usually where the cities, owing to the short-sightedness of previous administrations, have bound themselves to greater sacrifices in case they desire to obtain the control of the water works than on the whole they have been able or willing to make. But it is certainly true that everywhere in Germany the principle is now generally accepted that cities should own and operate their own water works entirely.

The case is not altogether so clear, perhaps, in the matter of the supply of gas. The improvements in the processes of manufacturing gas made it a feasible thing for most communities to provide for the introduction of this luxury, which has now, one may say, become a necessity of life, in the forties and fifties. The same may be said of the early attempts to provide for a supply of gas as has been above remarked relative to water supplies. The cities were in many cases unable to provide the necessary funds for establishing public gas works. Their administrations were very conservative and unwilling to take any great risks, and as a consequence the prevailing system during the fifties and sixties in Germany was that of entrusting this business to the ownership and control of private companies. But here the same tendency has made itself manifest to an increasing extent with every passing year, until the system of public ownership and control, if not quite so uniformly in the case of gas works as in the case of water works, has still come to be accepted as the proper and common one. In the year 1896, for example, 375 cities, large and small, in Germany owned and managed their own gas works. Of these, 120 had tried the system of private works in the first instance, but had gone over subsequently, at very considerable sacrifice in the way of large payments to private companies, to the method of city works. So that one can say, generally speaking, that the principle of public ownership and management of gas works is coming to be

as generally accepted in Germany as that of the public ownership and management of water works.

The introduction of electricity is still so recent that it is difficult to determine in any positive way what is the present tendency, taking the Empire as a whole. I can only express it, therefore, as my opinion, based upon such information as I have been able to collect, that the tendency to the public ownership and management of electric plants is quite as marked, though not by any means so fully developed, as in the case of the other departments above mentioned. This is destined to be of even greater significance for certain phases of municipal administration than either water or gas. Where cities own and manage their own gas works, it is evident that they must also own and manage their own electric plants if they are to prevent a very serious and perhaps injurious competition with their system of gas works. And it is my opinion that cities will either have to sell their gas works to private companies or else establish and maintain electric plants which can be worked in harmony and co-operation with the gas works.

If cities establish, generally speaking, great electric plants, the question of the relation of the city to the street car system will assume a new phase. Most of the German cities have either constructed the roadways of these street car lines themselves or own them, having been constructed by private companies. If they now establish great electric plants which will have practically the monopoly of the furnishing of electricity for lighting and power purposes, it will be a comparatively small step from furnishing electricity to the street car companies as traction power on their lines to taking over these street car lines themselves. There are certainly very pronounced tendencies of this sort in nearly all German cities and these tendencies are destined in my opinion to become even more marked than they they are at present.

SOCIALIZATION OF PUBLIC SERVICES.

One other circumstance should perhaps be mentioned of a general nature before passing on to the discussion of the principal subject of this paper. The policy of German cities in regard to these three necessities or conveniences of life has been dominated to some extent by different principles, owing to the different purposes which were primarly in view in the construction of these works.[1]

[1] The following leading cities of Germany own and operate their own electric plants: Barmen, Breslau (373,163), Bremen, Cassel, Dantsic (125,505), Dortmund,

The water works were established primarily to provide an abundant and healthful supply of water for private individuals, more especially for domestic consumption. The importance of a liberal supply of water, however, as an element in public administration, for the purpose of sprinkling and cleaning the streets, for flushing the sewers, etc., and as an aid to industry have both grown relatively speaking with great rapidity during the last generation. As a consequence, water works would probably be kept up now for the sake of industry and for the sake of public health alone, irrespective of their relation to private convenience; but the fact that they were established in the first instance, not so much for the benefit of the public administration in general as for that of private individuals and in the interest of public health has had a very pronounced influence upon the policy shown in managing these water works and upon the tariff of charges for the use of water.

The establishment of gas works by the cities on the contrary sprang in large part from the necessity which the cities had begun to feel of a better system of public lighting. It would hardly have been possible for the gas works to have been established so early in the history of these communities, if it had not been that the city would itself, for purposes of public administration, be a large consumer of the product of these works. As a matter of fact, it has continued to the present time to be the largest single consumer, and in many cases consumes nearly as much as all the other consumers put together. The feeling that gas was a luxury, or at most a convenience, of life, led the cities to adopt a system of management which has distinguished it very clearly from that of water works. Generally speaking, the element of net profit, the idea of securing a net income for the use of the city from the management of these works, has been an important one in the control and management of all the public gas works in Germany. As a result, what may be called the social point of view, that is, the view which looks upon gas as such a great convenience of life that its general use is to be desired in the interest of an advancing civilization and an advancing ease and refinement of life, and that consequently

Dresden, Düsseldorf, Elberfeld, Hannover (209,535), Cologne (321,563), Königsberg, Krefeld, Lübeck, Mayence, Nuremberg, Chemnitz, Frankfurt (229,279).

The city of Frankfurt took over April 1, 1900, the entire system of street railways, to be operated by electricity from the city works.

financial sacrifices may be made for this purpose, is a view which has only very slowly succeeded in making way into the minds of the managers of public gas works in Germany. As a result, generally speaking, the prices have been kept high, the facilities for the use of gas have been rather meager, and comparatively little effort has been made to enlarge the consumption.

Something of the same thing was true in the establishment of electric works. Here it was possible for the city to establish a small plant for furnishing light exclusively for city purposes, such as the lighting of public buildings, etc., upon a basis which made it fairly profitable for the city, irrespective of the number of private consumers who might take part in the support of such works. And it is quite possible that cities would have contented themselves with the erection of small plants for providing in this way the light desired for public offices and public illumination, without attempting to create a market for electricity in the mass of the public, if it had not been that the ever more imperative demand for electricity for purposes of lighting and power on the part of private individuals began to create a very sharp and severely felt competition with the products of city gas works. Then the cities began to realize that something of the same course of development would surely follow in the case of electric plants as in the case of gas and water.

It was impossible for cities to erect gas works for the purpose of furnishing gas to the city administration for city purposes at a reasonable price, unless a large number of private consumers could also be obtained whose consumption would help decrease the expense. Consequently the cities, in the management of the works, were compelled to have some reference to the needs of private consumers. In the case of electric works it was necessary for the city to furnish electricity to private consumers if it was to avoid ruinous competition with its own system of gas works, and thus, generally speaking, gas and electricity, from being looked upon as articles of luxury, have become first articles of convenience and finally articles of necessity, and cities are now everywhere recognizing that there is a social advantage, an industrial advantage, to be found in a liberal and cheap supply of gas and electricity, offered on the most favorable terms to every individual in the community. As a result of the recognition of this fact, there has come into the management of all public works of this sort in Germany within

the last few years an entirely new spirit, which is destined to work out the most far reaching results. Men are beginning to see that the supply of power at low rates to the small man in the most remote cities of the Empire means an increase of the power of Germany as a whole to compete with the foreigners in the world's market upon the most favorable terms. The fact that a city offers such facilities is, of course, a very great inducement to people who need power in the working of their industries, who need it in small quantities and at low prices, to settle in these particular places rather than in others in Germany. The fact that such facilities are offered in Germany and in proportion to the extent to which they are offered, does Germany as a whole become a more important element in the world market in every department of manufacture.

So much for what may be called the general course of development on this subject in Germany. Without being able to establish the proposition within the limits of such a brief article as this, I think I may lay it down as true, without fear of successful contradiction, that the tendency in Germany is steadily and rapidly toward public construction, ownership and management of all water works, gas works, electric plants and street railways, and that on the whole the policy underlying the management of these different departments of public administration is that of lowering the prices and increasing the facilities in the interest of a larger and healthful life, in the interest of an advancing industry, and in the interest of improvement of higher social conditions. This tendency is fairly represented in the history of the city of Halle in these matters.

The matter of water works may be disposed of in a single paragraph. The city of Halle has owned and operated a system of water works ever since the sixteenth century, and although various small private enterprises were started at different times to provide water for different portions of the suburbs or outlying portions of the city, they never acquired any considerable importance, and since the year 1867 the city has undertaken to provide for an ample supply of good water for domestic, public and industrial purposes. This has been done in a very satisfactory way. The water rates have been kept low. The encouragement for a liberal use of water has been continuous. And the policy of

the city in this regard has on the whole been an eminently satisfactory one. Although the works have at times yielded a profit, the general policy of the city has been to reduce the water rates and to increase the facilities as rapidly as circumstances made it possible. The experience of the city in this respect has been very similar to that of other cities in Europe and America. No suggestion that this important branch of public administration should be handed over to a private company has ever been made so far as I have been able to ascertain, and any proposition to do so would be looked upon by the entire population as absurd in the highest degree.

I.

ESTABLISHMENT AND DEVELOPMENT OF THE GAS WORKS.

As the result of an agitation extending over several years in the early and middle part of the fifties, the city administration, after having secured the promise of a large number of citizens to take gas at a certain price and in a certain quantity from the public works, received the consent of the superior administrative authorities to construct and operate a system of city works. The land was purchased for this purpose, a public loan was contracted, and the works were erected and went into operation on the 14th of December, 1856. They have been continuously in operation from that date to the present, and although the experience of the city during the first two years was rather unfortunate, still there has never been any serious proposition to hand over this department of public administration to any private company. The works have been gradually extended; the consumption of the city has grown, not only with the population but relatively much faster than the population, the latter having increased less than three-fold, while the former increased more than nine-fold, in the thirty-five years from 1862 to 1897. Whatever charges may be made against the administration of the city gas works, it cannot be denied that after they were fairly at work they have been administered with honesty and efficiency, within the limits of the principles adopted by the city; but one may criticise at more points than one the principles laid down by the city within which the works were to be administered.

The following tables set forth the growth of the works during the forty years—1856–1897—by five year periods; and the recent growth by years:

TABLE A.—DISTRIBUTION OF GAS.—1856–1897.

Period. [1]	Population.	Production. cbm.	Public Lighting. (Streets and Squares.)		Sold to Private Consumers and Public Offices.		Used in the Works.		Loss.	
			cbm.	%	cbm.	%	cbm.	%	cbm.	%
1856–62	41,507	2,870,574	431,651	15.3	1,870,461	65.1	52,539	1.8	514,843	17.9
1862–67	48,940	4,530,572	618,657	13.6	3,267,294	72.1	65,834	1.4	577,612	12.7
1867–72	54,314	6,423,774	852,989	13.2	4 794,003	74.6	71,811	1.1	705,026	10.9
1872–77	65,140	10,142,560	1,068,478	10.5	7,711,424	76.0	82,957	0.8	1,280,551	12.6
1877–82	74,816	12,211,736	1,533 216	12.5	9,112,957	74.6	187,048	1.5	1,375,015	11.2
1882–87	87,373	16 856,680	2,921,100	17.5	11,968 424	71.0	165,706	0.9	1,801,250	10.6
1887–92	106,000	24,151,300	4,674 597	19.4	16.375,326	67.8	293,003	1.2	2,804,174	11.6
1892–97	122,206	26,634,920	6,634,818	24 9	17.661 022	66.2	290,092	1.1	2,048,538	7.7
	Total	103,822.116	18.735,506		73,760,911		1,208,990		11.107,009	

[1] The first period is from Dec. 14, 1856, to June 30, 1862. The fiscal year was changed in 1887 so as to close March 31.

[2] A cubic m< ter = 35.3 Eng. cu. ft. 28.3 c m. = 1000 Eng. cu. ft.

TABLE B.—DISTRIBUTION OF GAS.—1894–1899.

Year.	Consumption per capita. cbm.	Production. cbm.	Public Lighting. (Streets and Squares.)		Sold to Private Consumers and Public Offices.		Used in the Works.		Loss.	
			cbm.	%	cbm.	%	cbm.	%	cbm.	%
1894–95	42.75	5,168,280	1.369,977	28.8	3,336,751	70.0	55,426	1.2	.....	...
1895–96	43.33	5,513,040	1,348.677	24.5	3,630,301	66.8	55.954	1.0	481,208	8.7
1896–97	46.15	5,891,120	1,390,226	23 6	4,026,285	68.4	58,748	1.0	412,511	7.0
1897–98	48.25	6,223,250	1,376,960	22.1	4,408,643	70.8	74,737	1.2	364,010	5.9
1898–99	57.37	6,956,720	1,217,561	17.5	5.141,350	74.0	83,722	1.2	504,387	7.3

TABLE C.—FINANCIAL ACCOUNTS.[1]—1856–1897.

3-31-1897, $482,058 Book Value of Plant.

Period.	Sinking Fund.	Profits Paid into City Treasury.	Cost of Works and Extensions.	Depreciation Fund.
1856–62	$20,633	.....	$183,190	$15,396
1862–67	56,543	.....	21,596	16,101
1867–72	19,271	$64,703	6,994	15,766
1872–77	22,579	94,738	70,584	19,085
1877–82	62,006	158,940	152,471	29,061
1882–87	70,275	174,642	55,255	34,278
1887–92	43,631	299,587	285,879	67,069
1892–99	22,606	356,047	92,769	106,804
Total	317,544	1,148,657	868,738	303,561

[1] In changing to American money, 4 marks=$1.

TABLE D.—FINANCIAL ACCOUNTS.[1]—1894–1899.

Year.	Sinking Fund.	Profits Paid into City Treasury.	Cost of Works and Extensions.	Depreciation Fund.
1894–95	$4,480	$68,155	$805,239	$17,125
1895–96	4,480	71,881	824,709	19,230
1896–97	4,480	75,516	.....	27,540
1897–98	4,480	79,591	978,534	34,187
1898–99	7,808	71,913	1,012,945	37,023

The following table shows the use of gas for cooking, heating and for power purposes during the six years ending March 31, 1899:

TABLE E.

Year.	Cooking and Heating. cbm.	Power. cbm.	Total. cbm.	Per cent of Total Amount of Gas Produced.
1893–1894	53,148	366,543	.....	....
1894–1895	109,417	420,406	529,823	10.2
1895–1896	117,920	499,506	617,506	11.3
1896–1897	180,798	566,321	756,119	12.8
1897–1898	230,466	644,171	874,637	14.0
1898–1899	321,018	845,045	1,166,063	16.8

It will be seen that the consumption per head of the population increased during the last quinquennium from 42.75 to 51.37 cbms., showing a steady relative increase during this period.

The present capacity of the works is about 47,500 cb. m. per day.

TARIFF OF CHARGES.

The following represents the course of prices charged for gas in the city works of Halle, from the establishment of the works to the present time :

I. Charge to private consumers per thousand English cubic feet for illuminating gas.

1856	$1.67
1859	1.88
1864	1.44
1870	1.35
1872	1.21
1898	1.08

II. Price to private consumers per thousand English cubic feet for heating, cooking and power purposes.

Up to 1887	Same as for lighting.
From 1887 to 1894	$0.91
Since 1894	0.6739

The above represents what may be called the normal or fundamental prices to private individuals. A discount has always been allowed, increasing in proportion to the amount consumed, varying from 2½ per cent for 10,000 cbms. or more up to 25 per cent for 50,000 cbms. and more. No discount, however, was given after 1887 upon gas used for heating, cooking and power purposes, being straight $.91 from 1887 to 1894 and straight $.6739 since that time. In the year 1898-9 eleven consumers obtained the 25 per cent rebate. Among these was the city for all gas consumed in public offices. Nine obtained 20 per cent; five, 15 per cent; twenty, 10 per cent; fifty-one, 5 per cent; two hundred and seventy-six, 2½ per cent. Out of a total of 3,651,581.49 cbms. sold for illuminating purposes, 2,678,915 cbms. were sold at discounts varying from 2½ per cent to twenty-five per cent.

Down to the year 1887 the city was obliged to pay for all gas consumed at the same rate as private persons, though its consumption was always sufficient to enable it to obtain the 25 per cent discount. From 1887 to 1898 it obtained gas for the purpose of street lighting at the rate of $.91 per thousand cubic feet, subject to no discount. This, it will be seen, was no real reduction, since $1.21 less 25 per cent = $.91. Since 1898 it obtains gas for the purpose of street lighting at $.6739 per thousand cubic feet, subject to no discount. That is to say, for gas consumed in public offices, the city has always paid and still continues to pay at exactly the same rate as private individuals, obtaining the largest allowable discount because its consumption always exceeds the largest amount for which the discount is granted. For purposes of

street lighting it had the same terms down to 1887. After that it was given the same rate for street lighting as private parties received for heating, cooking and power purposes. The reduction which was made to private parties for heating, cooking and power purposes, in 1894, was not granted to the city for street lighting purposes until the year 1898.

Until the close of the fiscal year 1897-8, that is, the 31st of March, 1898, the city gas works made a charge for the use of meters, which constituted for the small consumer a very serious addition to the price of gas. It also charged the private consumer with the cost of connections from a point six feet outside of the building line to the meter in the house. This constituted a very serious obstacle to the general introduction of gas into the houses. Beginning with the first of April, 1898, three important concessions were made in the matter of price and convenience to the gas consumer. The price of gas for illuminating purposes was reduced as will be seen from the above table from $1.21 to $1.08 per thousand cubic feet. The city gas works undertook to make connections at its own cost up to and including the meter, making no charge for the use of the latter, provided a certain minimum amount of gas was consumed. So that one may say now what one could not say prior to the first of April, 1898, that the cost of gas to the private consumer in his own dwelling for illuminating purposes or for heating, cooking or power purposes is the same as that quoted nominally in the tariff of charges, namely, $1.08 and $.6739 respectively.

METHODS OF BOOK-KEEPING.

It is difficult to ascertain from the printed reports of any corporation the exact condition of its business. It is still more difficult, generally speaking, in the case of municipal corporations. And it is most difficult of all in case of those branches of municipal administration which one may desire to compare with private corporations as to cost of the plant, running expenses, profits, etc. The books of the gas works of Halle show the entire expense of the works from the beginning to the present. They show that the works have been compelled to purchase the ground upon which they are erected, either from the city or from private parties, and that, therefore, the cost of the site is included in the cost of the plant. They show, moreover, that gas has not been furnished to the city at any time free of charge but that it has had to pay for

every cubic metre of gas consumed, though it has generally been placed in the position of the most favored consumer, owing to its large consumption. Thus, at present the city pays the same rate as noted above for purposes of street lighting as the private consumer pays for cooking, heating and power purposes. It pays the same for lighting in the offices as the private consumer pays for gas for illuminating purposes. From 1894 to 1898 the private consumer was somewhat better placed in the matter of rates for gas used for cooking, heating and power purposes than the city for street lighting. Just how much of a concession this has been to the city it is of course difficult to tell and the books do not show any special reckoning or account of this item.

No set off is noted in the books for taxes, corresponding to the taxes which a private corporation would be obliged to pay, under the ordinary rules prescribed for such companies. The works have always had to pay a state tax, under the head of the trade tax, amounting of late years to something like $1,500 a year. And although the proceeds of this tax are now handed over by the state to the city for municipal uses, this item of $1,500 a year for taxes still appears in the books. No item appears on the books corresponding to the special sum which a private gas company might be obliged to pay for the concession or the monopoly right to furnish gas to the community. The books show that a sinking fund has always been created whenever a debt has been created, amounting to at least one per cent a year. They also show that a renewal fund has been accumulated from time to time in anticipation of the necessity of reconstructing the works in order to bring them into harmony with improved and advanced conditions. The books also show that very considerable sums have been charged to the depreciation fund—sums sufficient to keep the works in good condition and, as experience has shown, to provide for extensions from year to year. Aside from the sinking fund, the renewal fund and the depreciation fund, considerable sums have been entered every year under the head of maintenance, which might have been charged to the capital account.

No one can examine these books without being convinced that the gas works on the whole show a very conservative and very sound system of book-keeping. Thus, if one deducts from the total cost of the works the sums charged off for depreciation, one obtains a book value of 2,220,241.08 marks ($555,060) at the end of

the year 1898-99. This represents a very conservative estimate of the present value of the works. It is the opinion of the director of the works and others with whom I spoke in the city that the works could be sold to-day as they stand for a considerably larger sum than this to a private company, not including, of course, the price which the company would be willing to pay for the franchise or for the monopoly right of furnishing the gas to the community. In other words, the system of book-keeping has been such as to make all proper allowances for depreciation of the works, and the sums written off each year have not only been sufficient to pay interest on the bonded debt, but also to accumulate a sinking fund equal to retiring the bonds when they fall due; not only a sum sufficient to keep the works in the present condition, but also a sum sufficient to reconstruct the works whenever the advance of science and technology should make this necessary or desirable, and furthermore to extend every year by a considerable amount the system of pipes, etc., connections with the houses, meters, plant, etc., etc.

The net income of the works based upon the estimate of the state tax commission assessing them to the trade tax was for the past year 338,113.74 marks ($84,528). The capitalized value of the plant according to the same estimate was 2,741,815.45 marks ($685,454). This would show that the works paid a dividend of 12.3 per cent on the capital value of the plant or a dividend of 3 per cent on more than ten millions of marks, while the actual book value as shown above is less than two and a half million marks. Of course in this larger value would be included the value of the franchise; but even so, this shows a very conservative estimate of the value of the works in the accounts of the works themselves.

The accounts of the works for the year ending March 31, 1899, show that the total income was 1,416,111 marks ($354,028). Of this, 287,652 marks ($71,913) were turned into the city treasury, representing 20 per cent of the total income; 90,192.20 marks ($22,548) were set aside for extensions of the plant, representing 6 per cent of the total income; 30,000 marks ($7,500) were set aside for the renewal fund, representing 2 per cent of the total income; 31,231 marks ($7,808) were set aside for the sinking fund, representing 2 per cent of the total income; 36,138 marks ($9,034) were used for the purchase of new instruments, apparatus, gas meters, etc., representing therefore an actual increase of the pltna

to that amount, equal to 2 per cent of the total income. A balance was left on hand of 27,823 marks ($6,956) which, together with the sums already indicated, made up a total of 503,036 marks ($125,759), leaving a sum of 913,075 marks ($228,269) to represent the current expenses of the works. In this sum, however, again very considerable items were included for cost of maintenance, which conception covered also in certain instances actual additions to the plant. If we count the renewals, extensions and the purchase of new equipment, it will be found that about 7 per cent of the book value of the works at the end of the preceding year had been added to the plant during the current year—1898-9. The accounts show that the works have written off during the past years an average of 3 per cent a year under the head of deterioration to the account of lands, 3 per cent for buildings, 10 per cent for apparatus (retorts, furnaces, etc.), 7½ per cent for the pipe system, 20 per cent for implements, 20 per cent for meters, etc., etc. Thirty per cent was written off during the past year for house connections, since under the arrangement now in existence, connections made by the gas works within the property of the house owner passes into the possession of the house owner himself. From whatever point of view, therefore, the accounts are examined, it would seem as if the gas works are pursuing a very conservative and safe policy, maintaining the works in their present condition, extending them and improving them.

RESULTS OF MUNICIPAL OPERATION.

If we sum up the results achieved by the gas works of the city during the period from 1857 to 1899, we should note especially the following points. In the first place, the city now has in its possession and entirely at its disposal, to do with as it chooses, a plant for the manufacture of gas, with a capacity of 17,327,500 cbm. per year, with a capitalized value, after deducting all debts and obligations of every sort, of 2,241,873 marks ($560,468) capable of paying dividends on a capital of from ten to twelve millions.

In the second place, a plant from which the city has derived a very large sum in net profits, amounting all told to more than five millions of marks ($1,250,000).

In the third place the city has enjoyed during all these years the advantage of a liberal gas supply for public purposes, street illumination and public offices, at a price considerably below

the average price charged for gas by private companies or cities in Germany at large.

In the fourth place, the private citizens have had the advantage of comparatively low prices for gas during the entire existence of the works, for if the tariff of charges made in Halle be compared with that in other cities, whether made by city works or private works, it will be found that prices in Halle are on the whole slightly below those of cities similarly situated.

The city has, moreover, the very great advantage of being in a position to regulate the policy of the gas works in accordance with its notions of the best interests of the city and the citizens, without having to pay a private company large sums of money for this privilege. How important this is, may be seen from the recent events in the history of the city mentioned already in the above paragraphs. It was felt that the prices of gas should be lowered to the private consumer and to the city. It would have been difficult to have brought this about under a system of a private management. A mere resolution of the city council was sufficient to accomplish this, beginning with the first of April, 1898, and, as noted above, this was not simply a reduction in the price charged for gas, but it involved a very large additional reduction to the small consumer, because at the same time the charge for meter rent was practically abolished and the cost of making connections was assumed by the gas works.

It is an interesting fact which may be mentioned in this connection that the introduction of the so-called glow burner, the Auer or Wellsbach burner, has had a very material influence upon the course of prices and the course of consumption. The general introduction of this burner enabled the private consumer to obtain a very much better quality of light at a much lower price, owing to the smaller consumption of gas, than had been hitherto possible. This led on the one hand of course to a certain reduction in the amount of gas consumed for lighting purposes per light, but on the other hand, owing to the very greatly increased attractiveness of this light, it led many people to prefer the introduction of gas to the continued consumption of coal oil. An increased price of the coal oil itself was not without effect in stimulating this gas consumption. And, as said above, the competition which private electric plants were making with the city works was so seriously felt as to lead the city to make concessions in this matter which it might not formerly have done.

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It is worthy of note that the city works have lately adopted for the first time in their history a new point of view, namely, that it lies in the interest of the community as a whole to increase the consumption of gas, to supplant the use of coal with all the inconvenience and dirt connected with it by the use of gas; and for the first time in the history of the works during the past four or five years, efforts have been made to extend the use of gas, not only by the reduction of price and the abolition of obstacles to the introduction of gas, but by a positive recommendation of the use of gas to the public, such as the holding of exhibits of gas stoves, heaters, etc., and public lectures upon the method of utilizing gas for cooking, heating and power purposes.[1]

It is furthermore a point not to be underestimated that the city, having control of these works, may furnish gas for power purposes at a rate at which no private company would undertake to offer it. This policy is justifiable because the existence of a cheap, easily divided power facilitates the development of many forms of industry which might not otherwise be so easily possible.

Whether private works would have accomplished the above results, or, if not the above, other and more favorable results, cannot of course be determined in any positive way by an examination of the history and working of this municipal enterprise. But it is certain that the city of Halle, and indeed I think I may say that no individual in the city of Halle who is not connected with some private gas company would consider for an instant the advantages which a private company might offer when laid in the balance against those which the city works secure. There seems to be an opinion in Halle, both at the works and at large in the city, that no special concessions have been made to the laborers at the works. The administration has aimed to pay the usual local rate of wages—neither more nor less. The greater permanence of employment makes the work on the whole so attractive that they can have their pick among the laborers in the community. The effort is made to keep the same laborers as long as possible and if

[1] It should be stated that thus far but little use of gas has been made in Halle for the purpose of illumination in private houses. Nearly the entire consumption up to within a year or two has been for public lighting (either streets or offices) and in the shops, factories, stores, banks, etc. The city works have, therefore, before them an almost unexploited field of possible consumption which is likely to prove more profitable every year; though this very fact, it must be admitted, is a just cause of reproach to the administration, in that it has not worked this field long before.

they have grown old in the service they will not be allowed to starve, even if they become incapacitated for work. The city gas works are subject to the general imperial laws relating to compulsory insurance which are applicable to all employers of labor.

II.

THE CITY ELECTRIC PLANT.

Since the introduction of electricity in 1887, '88, '89, '90 and '91, and the rapidly growing utilization of the same for purposes of lighting and for power, German cities have had to face the question whether they would grant to private companies the right to lay their wires in the city streets and furnish electricity to private consumers, or whether they would undertake the manufacture and sale of electricity themselves. They have shown a certain reluctance to embark upon the business of furnishing electricity to private parties. As a result, in many directions electricity has not been introduced as rapidly as it would have been introduced if the cities had been willing to grant permission to private companies to undertake this work. Halle is perhaps a good example of this fact. Up to the present, electricity has not found that wide, extended application for purposes of lighting and power in the city of Halle which one might have expected from the rapidly growing industrial character of the city. The city has refused to grant permission to private companies to lay their wires in the streets, and as a result electric lighting is very largely limited to individual plants or blocks of land which can be reached from all parts without making use of public highways.[1]

The general introduction of the Auer burner spoken of above has tended to reconcile the people to the lack of electricity for lighting purposes, but the pressure on the part of private individuals and of public companies for a supply of electricity finally became so great that the city was compelled to take up a definite and distinct attitude toward this problem. The feeling at first was overwhelmingly in favor of granting a concession to a private company and making such terms for the grant of the franchise as the city might be able to do. Various commissions were appointed.

[1] So far has this unwillingness to favor electricity gone that the city works have uniformly refused to give the lowest rate of 10 pfgs. per cbm. to consumers who used the gas to drive engines for the manufacture of electricity for lighting purposes, *i. e.*, they refused to favor their competitors in the business of furnishing light; even though they were entitled to this favor under the general rule.

Some of these made very careful technical examinations with the aid of technical experts. Some of them visited the works built in other cities. And the final outcome of the whole movement, after a very excited and in some respects bitter discussion, was an overwhelming vote in the city council in favor of public construction, ownership and management of an electric plant. It is an interesting fact that all experts consulted by the city council or its committees, who were not personally connected with some private electric company, advised the city by all means to install its own electric plant, to construct, own and operate on its own account, without recourse to the medium of a private company.

The arguments advanced by Professor Karl Schmidt of the University of Halle, in favor of city management, were convincing and, when supported by the opinion of Dr. Klingenberg of Berlin, commanded the assent of the city authorities. It appears from their report that they sent a schedule of questions to thirty-one cities, which in their size or their industrial importance might be compared with Halle. Of twenty-nine cities from which they obtained reports, twenty two owned their own electric plants, and from the first of April, 1899, nineteen of them will manage their own works directly, only ten out of the twenty-nine having entrusted the management to private hands. Cassel, Elberfeld and Cologne are building new and extensive plants at their own cost and will undertake the management of the new works. It is important to notice that these cities, at a time when it is necessary to construct entirely new plants, have decided that they would construct and manage them themselves, after having had an experience of from nine to twelve years with the older type of works. The statement is made by the committee which visited these various plants that they found the public sentiment nearly universal that a city like Halle, in which industry has taken on such an enormous expansion of late years, ought not to hesitate a moment to construct and manage its own electric plant. It was the opinion of the experts without exception that the construction and management of an electric plant is much simpler than the construction and management of gas works and that where a city has successfully performed the latter, it may without doubt do the former.

It will be of interest to note the points which Professor Klingenberg made in favor of public works, for it was his argument which finally decided the question in favor of a city plant.

He called attention in his expert report to the fact that experience had shown ever more clearly that those cities which did not own and manage their own gas works and their own water works were at a great disadvantage as compared with those cities which did; and in his opinion the same thing was true now and would be still truer in the future, of electric plants.

It is possible that a city may make an agreement with a private company which for the immediate present would be satisfactory and fair to both parties, but in a department of industry where changes are so rapid, experience has shown that it is extremely difficult for a city to change its contract with a private company in such a way as to be of advantage to it. It must nearly always pay a very high sum for the privilege of doing so. As the private companies are thus successful in opposing any change from which they do not derive the very highest advantage, the city is practically compelled to hand over to the private company a much larger proportion of the returns than would otherwise be necessary. He called attention further to the fact that the city which owns gas works can hardly permit a private electric company to come in and compete with it, as the situation would become practically untenable for one or the other. He emphasizes, moreover, the fact of the great advantage which a city may obtain from having the power of altering the rates in accordance with its general industrial and social interests, without consulting the special interests of a private company. He is, moreover, of the opinion that judging from experience it is impossible to make an agreement with a private company, by which the works can be kept in a proper condition and handed over to the city at the expiration of a lease under conditions which will be reasonably favorable.

As a result of these various reports, a commission worked out an estimate of the cost of the enterprise, which was laid before the city council on the 7th of November, 1899. The proposition called for an appropriation of 2,600,000 marks ($650,000). It was approved by the city authorities and a public loan was negotiated, at the rate of 3¾ per cent, from the city savings bank.

The city has thus begun the experiment of a city electric plant to furnish light and power for illumination, cooking, heating and driving machinery. The experiment is likely to have far reaching results. Already the city authorities are working out a plan of assuming the entire system of street railways in the city, which was

built by private companies and is run by electricity. The city may purchase these roads under the terms indicated in the contracts between the private companies and the city and it is believed that a favorable opportunity is now offered of managing them at a reasonable rate. There is little doubt that before long the entire system of railways, considerably enlarged and extended, will be in the hands of the city.

What the practical outcome of this state of things will be is of course something for the future to decide. But, judging from the experience of the city administration up to the present time, there is every reason to anticipate a successful result, even though it may not in all respects correspond to what the advocate of private ownership would claim for the private system. It is interesting to note by the way that Halle was the first city in Germany to introduce a system of electric traction in its street car system upon a large scale. It is extremely well provided with street car facilities, as such cities go in Germany. The rates are low and the service satisfactory. The city receives a certain proportion of the net profits of the companies. Whether it would make a better bargain with private companies to continue the present system or would obtain greater profits by undertaking the management itself is something of course which at present writing nobody can determine; but public opinion is drifting rapidly and surely to the side of public ownership and management.

PUBLIC GAS WORKS IN ITALY.

By Riccardo Bachi.

During recent years the municipalization of public services has gained considerable popularity in Italian cities. The old-time notion that the city was the worst possible administrator and as such should confine itself to a minimum of functions, is now giving place to a new tendency which seeks to entrust to the municipality more extended social functions and wider activities in economic life.

Thus, under the pressure of public opinion, numerous cities have recently assumed the management of the gas supply. Padua, Como, Spezia, Vicenza, Voghera, Asti, Vercelli, Udine and Reggio-Calabria have established municipal service, while other cities hold this matter under advisement, notwithstanding the hostile attitude of national legislation. All of these cities are of medium size and importance. The larger cities, such as Naples, Rome, Milan, Turin and Venice, which by taking over these services would open a plentiful source of income, are bound by long-term franchises with private corporations.

PADUA.

In Padua, a city with over 90,000 inhabitants, near Venice, the supply of gas was in the hands of a private company (*Società Civile Lionese*) since 1845. The first franchise was renewed May 27, 1867, for 29 years, expiring September 30, 1897. The price of gas was fixed in 1867 at 16.46 centesimi per cubic meter (93.2 cents per 1000 cubic feet) for public lighting, at 17.28 centesimi (97.9 cents per 1000) for the city hall and extraordinary occasions, at 36 centesimi ($2.04 per 1000) for other public institutions, and at 38 centesimi ($2.15 per 1000) for private consumers.

In 1887 the company sought to obtain an extension of the franchise until 1917, proposing to lower the price for industrial and household purposes to 28 centesimi ($1.59 per 1000) per cubic meter. The offer was renewed in 1890, but the far-seeing municipal of-

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ficials steadily refused to entertain the proposition, having in mind municipal operation.

The franchise granted in 1867 provided for the purchase of the works and pipes by the city on the basis of an "industrial valuation." Negotiations were began in 1895 under the direction of the gas manager of Triest, whose services had been secured by the city. After various propositions and counter propositions had been made, an agreement was reached by which the city was to begin operation before the expiration of the franchise, *i. e.*, August 1, 1896, and pay the company 380,000 lire ($76,000) for its plant and pipes and 270,000 lire ($54,000) as compensation for the profits which the company might realize during the remainder of the franchise period (14 months).

In order to improve the facilities, the municipality soon resolved to extend its plant and pipe-lines at an expense of 170,000 lire ($34,000), besides setting aside 100,000 lire ($20,000) as operating capital. Furthermore, in order to insure accurate and independent financial administration, the Popular Co-operative Bank (*Banca Co-operativa Popolare*) was made the depository of this new municipal department, keeping an account of all receipts and expenditures.

The management and control of the plant was vested by the ordinance of June, 1896, in a commission composed of seven members and elected by the municipal council, four of whom were to be replaced at the end of three years, and the others three years later. Three members could be private citizens—outside the city council. This commission presented to the municipal council through the municipal board (*giunta municipale*)[1] during October the estimates for the coming year including cost of necessary improvements, and in March its annual report for the past year. The price of gas was fixed by the municipal council with the advice of

[1] According to the municipal laws of Italy, the enrolled voters of each commune elect municipal councillors (*consiglieri municipali*) who constitute the municipal council (*consiglio comunale*)—a body having legislative functions. The executive functions rest with the municipal board (*giunta municipale*) composed of a number of municipal councillors, varying according to the population, but always selected by the municipal council itself. The presiding officer of the *giunta* is the mayor (*sindaco*). The *giunta* is analogous to a cabinet of ministers, the syndic exercising supreme control over the entire municipal administration, while the single members of the *giunta*, called assessors, have charge of some particular branch of service, such as lighting, public works, schools, etc. The *giunta* presents each fall to the municipal council the estimates for the coming year, which are discussed and voted by the council.

the commission. The purely executive part of the management was entrusted to a director, subject to the authority and supervision of the commission.

This ordinance remained in force only a few years. A commission composed of private citizens and members of the city council proved not to be the best method of management. Not all of the members showed the necessary technical knowledge and the minute care essential for the successful management of such an important industry. In February, 1899, a new ordinance was passed which nominally places the mayor (*sindaco*) at the head of the department, but the responsible manager is a director who is paid a considerable salary and who is given large powers. The price of gas is fixed by the municipal council at the suggestion of the municipal board. The latter also determines the price of the various by-products, meter rents, and the prices for which gas appliances are sold or rented. The *giunta* also fixes the number, duties and salaries of the higher officials and has the sole right of appointing them. The director has complete control over all other employees, and with the mayor hires them and fixes their salaries. This system has given satisfactory results.

On October 1, 1897, the price to private consumers was lowered to 20 centesimi ($1.13 per 1000) for lighting and heating (including the government tax of 2 centesimi) and to 18 centesimi ($1.02 per 1000) per cubic meter for industrial purposes. The result was a considerable growth of consumption.

	Cubic meters.
From August 1, 1895, to July 31, 1896 (private management, price 38 centesimi), the consumption by private persons was	902,955
From August 1, 1896, to July 31, 1897 (municipal management, price 38 centesimi), the consumption by private persons amounted to	965,696
An increase in one year of about 7 per cent	62,741
With the reduction of price, consumption rapidly increased. During the last quarter of 1896 (municipal administration at 38 centesimi), the consumption was	322,239
Last quarter of 1897 (municipal administration at 20 and 18 centesimi respectively)	431,951
An increase of about 34 per cent	109,712

This increase of consumption steadily continues. Private persons consumed during 1896, 923,700 cubic meters; during 1897, 1,093,000; and during 1898, 1,423,000. The estimated consumption for 1900 is 1,533,000 for private lighting and 70,000 cubic meters for motor use—an increase of about 75 per cent in four years.

The financial results have been excellent. Between August 1, 1896, and September 30, 1897, the price of gas was the same as charged by the company. The estimated profits for this period of 14 months were 270,000 lire ($54,000). The profits actually realized amounted to 290,000 lire ($58,000). The *net* yearly profits of the service are now, with reduced prices, about 70,000 lire, ($14,000) and are used for the rapid amortisation of the bonds, so that within *ten* years the municipality will own free from all debt a revenue-producing plant and have a relatively large income, which under private management would have gone to private speculators. To this *net* profit, one may properly add 45,000 lire ($9,000), a saving to the city in the cost of public lighting. This expenditure, $18,000 prior to municipalization, is now less than $9,000 per year.

The laborers of the department have also benefitted by municipalization. A special fund (*Cassa di Previdenza*) has been instituted for their benefit. This fund is formed from contributions by the laborers—a three per cent deduction from their salaries—and a contribution on the part of the city of seven per cent of the salaries paid. From this fund the employees receive aid in case of sickness and accident.

Under municipal operation many important improvements for the purpose of increasing the production and distribution of gas have been made. Immediately after taking over the plant, it was greatly extended and modernized. Additional holders were constructed, new mains laid, new condensers, washers, scrubbers, furnaces, etc., purchased; and in every other way the works have been kept up to date.

SPEZIA.

The city of Spezia erected in 1865–66 a gas plant of sufficient size to meet the contemporary demand, which did not exceed 500 cubic meters per day. The total cost of real estate, plants, pipes, etc., amounted to about 150,000 lire ($30,000). The works were leased to private companies, but the results were so unsatisfactory that in 1877 the city took direct control and began operation. The

increasing demands necessitated the enlargement of the works from time to time, and the capital outlay up to date reaches 450,000 lire ($90,000). The maximum capacityof the plant has been increased ten fold, the average yearly production being 1,250,000 cubic meters. Of this amount 640,000 cubic meters are furnished to private consumers and the government bureaus for lighting, heating and power; 330,000 cbm. are used to light the city and its suburbs; 130,000 cbm. in municipal buildings, school-houses and other buildings for public use, and the remainder is lost by leakage and condensation in the pipes.

Gas is sold at 25 centesimi per cubic meter ($1.42 per 1000) for lighting, and 20 centesimi ($1.13 per 1000) for power and heating, including the government tax of 2 centesimi per cubic meter.

The approximate yearly receipts from the sale of by-products (coke, tar, etc.) amounts to 60,000 or 70,000 lire ($12,000–$14,000), exclusive of the value of coke consumed in the municipal buildings and gratuitously furnished to the schoolhouses and public buildings. The average operating expenses are about 190,000 lire $38,000) per year, and the receipts reach nearly the same sum, so that the city is able without extra cost to light all the streets and municipal buildings free of charge besides a number of schools and public buildings.

COMO.

Como is a rich industrial city of northern Lombardy, having about 37,000 inhabitants. Its gas works were constructed about the middle of the century by the *Società Italiana per il gas.* When the franchise was about to expire (in 1894), a struggle between the municipality and the company took place, which threatened to leave the city without light for some time at least, as the municipal administration would not relinquish its rights and did not wish to extend the franchises. To secure control of the works, the city was called upon to pay 400,000 lire ($80,000). The local banks were willing to advance the capital, but at an excessive rate of interest. At this juncture a wealthy citizen drew a check for the amount which he loaned to the city at the relatively low rate of 4½ per cent. Thus the municipality of Como came to own its gas works on November 1, 1894.

The management of the industry is in the hands of five persons chosen by the municipal council, three of whom must be

members. The purely executive work is performed by a director chosen by the same body.

The financial results have been from the first very excellent. During the year 1895, the private consumption was 1,248,014 cubic meters, and the public consumption 158,895, the gross profits (the sum remaining after paying cost of production) amounting to 115,954 lire ($24,000), expended as follows :

	Lire.
Rent of building (municipal property)	5,633
Municipal gas tax	13,087
Interest charges	19,550
Public lighting	27,038
Amortisation of the capital debt	20,000
Net profits	30,646
Total,	115,954

During the year 1896 the private consumption was 1,359,000 cubic meters, and the gross profits were 183,458.49 lire ($37,000), distributed as follows :

	Lire.
Depreciation account	58,085
Public lighting	46,004
Municipal gas tax	13,737
Rent	5,632
Interest charges	19,550
Net profits	40,450
Total,	183,458

For the year 1897 the figures remainded almost unchanged, while the net proceeds reached about 85,000 lire, leaving, after a deduction of 20,000 lire for amortisation purposes, some 65,000 lire—a large gain. Finally, for the year 1899, this gain is estimated to reach the satisfactory total of 72,880 lire.

VICENZA.

Vicenza is a town of about 40,000 inhabitants, situated near Padua. As in the latter city and Venice, the gas supply was in the hands of the *Società Civile Lionese* since the year 1845. This corporation had made a net profit of from 50,000–60,000 lire ($10,000–$12,000) on an annual sale of 480,000 cubic meters at the exorbitant price of 40 centesimi per cubic meter ($2.27 per 1000).

When the question of renewing the franchise, which expired in May, 1897, came up, the municipality decided to follow the example of Padua and municipalize this important service. The plants and pipes were bought for 165,000 lire ($33,000)—a somewhat exhorbitant sum, as the pipe system was defective, causing each year a leakage of 70,000 cubic meters. Under municipal administration, the production of gas increased from 480,000 to 560,000 cubic meters and the price was reduced first to 30 centesimi ($1.70 per 1000) and then to 22 centesimi per cubic meter ($1.25 per 1000) for private consumers and 18½ ($1.05 per 1000) for public use. The present prices are 25 and 20 centesimi respectively owing to the rise in the price of coal. Meter rents have been reduced almost one-half. Notwithstanding these large reductions, the municipality in 1898 cleared a profit of 25,000 lire ($5,000); in 1899, only about $2,000 owing to the increase in the price of coal. Further, the cost of public lighting under municipal management has gone down from 45,000 lire to about 27,000 lire (from $9,000 to $5,400).

Following the example of Como and Padua, the municipality of Vicenza turned over the management of its gas department to a director and administrative commission, the latter composed of the mayor and four other members, two of whom are municipal councilors. But just as in Padua, it has now been found to be more convenient to entrust the entire management to a responsible director, so that the latest scheme for reforming the municipalized services—gas supply, water, electric light and motive power—proposes to put the combined services in charge of a single technical expert who is to be responsible for their proper management.

Under municipal management, a part of the gas mains was laid by direct labor, the city hiring and supervising the laborers, at an expense as low as 64.5 lire ($1.30) per meter; while the normal cost under the contract system would have been 8 lire ($2.00) per meter. Twenty-three men are employed at the works who labor under the same unsatisfactory conditions as fixed by the *Società Lionese*—a work day of 12 hours and very low wages. Firemen receive only 2.40 lire ($.48) per day, and wages in private establishments are higher.

With municipal operation, a noteworthy increase in the total quantity of gas consumed, as well as the number of consumers took place, but the use of gas did not extend to the poor classes, possibly

because installations were not made gratuitously. The introduction of penny-in-the slot meters was proposed, though not sanctioned, as these meters did not meet with success in Milan and other large Italian cities. Gas is yet but little used for heating purposes.

The service also has been much improved from the technical standpoint. The illuminating power has not been changed, owing to the probable general use of the Auer mantels. Instead, attempts have been made to purify the gas by eliminating as far as possible the presence of sulphurated hydrogen and to improve condensation. A new gas-holder is now under construction, and to prevent leakage and to make possible a higher pressure, the mains are being renovated. During the year 1900 about 6000 meters will be laid at an estimated expenditure of 150,000 lire. When these changes have been accomplished it will be possible to stimulate a further increase in consumption and bring about more satisfactory fiscal results.[1]

ASTI.

The contract made with the *Società Italiana del gas* in 1883 terminated November 15, 1898, when the gas plant and pipe lines became municipal property. As this date approached, the municipality received various offers for the franchise, and even proposals to organize the gas consumers into a co-operative society. But the municipality, after a prolonged investigation undertaken by the mayor and municipal board into the advantages and inconveniences of various systems of administration, decided to inaugurate municipal service. After long and wearisome negotiations the company agreed to accept 28,775 lire for the works, including the mains, the material on hand and the gas meters rented to private individuals. The works were in the worst possible condition and the city immediately set about to improve them, introducing modern methods and new machinery.

The financial results have been all that could be desired. The actual receipts have proved larger and the expenditures less than estimated, leaving a net profit of 15,000 lire ($3,000). Consumption increased 100,000 cubic meters within a year and the number of consumers 353. The price of gas has been reduced from 25 to 20 centesimi ($1.42 to $1.13 per 1000) for private

[1] For information regarding the municipal plant at Vicenza, the writer is greatly indebted to the courtesy of the director, Mr. Vittorio Carli.

lighting and to 16 centesimi (90.6 cents per 1000) for public lighting and power.

The salaries of the workmen have been increased and are continued during sickness. A fund for insuring workingmen against accidents has also been started, and old age pensions will probably soon be adopted. Aiming to raise the efficiency of the force, the technical manager has been allowed a certain share of the profits over and above his salary, and a plan is now under way whereby the ordinary workmen will secure the benefits of a system of profit sharing.

BOLONGA.

The city of Bologna (population in 1897—153,206) granted a franchise in 1862 to the *Compagnie Genèvoise de l'industrie du gas*, which was to terminate November 28, 1912. According to this agreement the company supplied gas until recently on the following terms :

For street lighting, .32 lire per cubic meter ($1.80 per 1000).
Private consumers

for lighting	.25	"	"	"	($1.41	").
for heating	.23	"	"	"	($1.30	").
for laundry use	.21	"	"	"	($1.19	").

Early in 1900, Mayor Alberto Dallalio, who has repeatedly expressed his belief in municipal ownership, perfected negotiations with the company for the transfer of the plant to the city. On May 2, the municipal council approved the agreement by a vote of 52 to 17, and the city assumed possession of the works on July 1, paying the company $750,000 for the works and $400,000 for the franchise—$1,150,000.

The Bologna municipal plant is by far the largest public plant in Italy. The great cost has made many doubt the advisability of the undertaking, and maintain that it would have been more advantageous for the city to have waited until the expiration of the franchise in 1912 and then purchased the plant at a very low price or constructed new works possessing all the latest improvements and the most modern processes. Others fear the competition of electricity.

PROJECTS OF MUNICIPALIZATION.

In view of the approaching expiration of the franchise of the private gas company, a strong agitation in favor of municipalization has sprung up in Leghorn (*Livorno*), Tuscany, a city with

over 100,000 population. Within the municipal council, the plan is advocated mainly by the Radicals, Republicans and Socialists. Members of the moderate parties are more or less opposed. The question has become a party issue, and most likely the government, availing itself of a power not possessed in many other countries, will dissolve the council. New elections will then be held with municipalization of gas as the paramount issue.

In Turin, one of the largest Italian cities, with a population of over 350,000 inhabitants, the supply of gas is in the hands of two private companies, between which, however, there is no competition whatever. These two companies hold franchises to use the streets expiring in 1923, but the contract for public lighting runs for a short period and terminates in 1901. For many years, both in the press and in the council chamber, a municipal plant has been advocated which would compete with the private companies until the expiration of the franchise and then would assume the entire service. Preliminary investigations have been made and the scheme has been favorably reported upon by a finance commission appointed in December, 1896. Such a plant would hardly become a source of revenue, as both companies founded long ago have by this time paid off the greater part of their capital and could thus quite easily afford to reduce the price in order to crush the municipal plant. The benefit to the citizens at large, however, might be sufficient to warrant the venture. The agitation in favor of municipalization has recently become stronger, as the companies have increased the price of gas, beginning with October 1, owing to the coal crisis.

By the time these pages are printed, the construction of a municipal water-gas plant will probably have been begun in Casteggio, a small town of Lombardy with a few thousand inhabitants. The small size of the town adds special importance to this experiment in municipal activity, which is perhaps the first attempt to introduce in Italy the use of water gas. The municipality appointed some time ago a special technical commission for the examination of the question, which recommended the use of water gas. The experiments made in June, 1900, gave very satisfactory results, so it is likely that the coming year will see the installation of the plant.

The above constitute all the municipal gas plants in Italy. With the exception of Spezia, all are of recent origin, so that it is

not yet possible to give a positive opinion as to their permanent success and their fiscal and social consequences. However, the results obtained in these first years of municipal operation permit the hope that in Italy as well as elsewhere the municipality may gradually acquire new functions and find for itself new fields of activity. The larger plants—those of Como and Padua—have shown great development under municipal management and operation. These municipalities have boldly adopted new technical methods, proving the utter fallacy of the old prejudice, viz., that public management was averse to all progress. It would, however, be but fair to say that the principal factor which urges the Italian municipalities along this new road is the need of larger incomes. Most of the cities are in a deplorable financial condition. Moreover, the Italian system of local taxation is based mainly on an indirect tax, unfair and burdensome to the poorer classes, the taxes on consumption (*octroi*). Municipalization seems to offer a solution by opening up a new source of revenue, which would also enable the municipal authorities to lighten somewhat the heavy tax-burden which now rests so heavily on the working classes.

MUNICIPAL ELECTRIC LIGHTING IN DETROIT.

By John A. Fairlie.

The Detroit municipal electric lighting plant was inaugurated in 1895 and has now been in operation for five years. Except Chicago, it is the largest municipal plant in this country; and the results of five years' experience under a municipal system as compared with the previous system of contract lighting should be of wide interest and value.

A brief historical sketch of electric lighting in Detroit under both private and municipal management will serve to introduce the discussion on the comparative results of the two systems. Electric lighting was first introduced in Detroit in 1882; the following year an experimental contract was made by the city for lighting two of the principal streets; and in 1884 the contract for the entire public lighting of the city was awarded to the electric light company. Three hundred arc lamps of 2000 candle power each were employed; but in place of single lamps at frequent intervals, these were grouped in seventy-two towers from 100 to 250 feet in height. For these the city paid at the rate of $240 for each arc lamp. Yearly contracts were made with the same company for each of the next five years, the number of arc lamps increasing steadily to 719 in 1890, and the cost per lamp falling by stages to $191 in the same year. In 1890 another company underbid the first company, and a three years' contract was made with the new concern at approximately $130 a lamp. The number of lamps was increased at once to over one thousand, and by 1894 there were 1279 arc lamps in use in the public streets. A large number of single lamps were now used in addition to the tower groups.

In the spring of 1893 proposals for a new contract for public lighting were invited. The only bid received was from the company then lighting the city, which submitted a schedule of rates varying from $155.73 per lamp for a one year contract, to $124.10

for a three year contract, and $102.20 for a ten year contract. The project for a municipal lighting plant was already under serious consideration; and on the recommendation of the comptroller, the proposal was rejected by the common council on March 14. Afterwards the public lighting commission made arrangements with the company to continue its lights pending the introduction of the municipal plant at a sum which averaged about $132 per arc lamp.[1]

MUNICIPAL PLANT CONSTRUCTED.

Agitation for municipal lighting had been begun as early as January, 1890, by Mayor H. S. Pingree in his first message to the common council. In each of his subsequent annual messages in 1891, 1892 and 1893, the mayor again urged the building of a municipal plant, and presented data and arguments in support of this project. In 1893 a bill authorizing the city to establish municipal lighting was introduced in the state legislature, which was passed and became law March 18. April 3, under the provisions of the act, the question was submitted to the electors of the city, who voted 15,282 to 1,245 in favor of a municipal plant. A public lighting commission of six members was at once appointed, and bonds to the amount of $600,000 authorized, and in time sold, to defray the cost of erecting the new plant. A convenient site on the river front was selected for the central station, a neat but not extravagant building constructed, and the necessary equipment of machinery installed. An underground (conduit) system of distribution was built for the district within a half mile of the city hall, and beyond that the system of overhead wires was continued.

[1] STATISTICS OF PUBLIC LIGHTING IN DETROIT BY PRIVATE COMPANIES.

Year ending June 30.	No. of Lamps.	Amount Paid.	Cost per Lamp.
1884	24	$3,649.53	$152.07
1885	300	71,982.00	239.94
1886	382	91 570 97	239 71
1887	565	115,490 26	204.41
1888	608	117.370 18	193.04
1889	702	128,068,78	182.42
1890	719	137,937 30	191.84
1891	1031	133.716.55	129 69
1892	1168	152.282 70	130.38
1893	1279	164.830 91	128.87
1894	1279	169,360 35	132.41
1895		153,004.36	
1896		28,796.41	

April 1, 1895, the commission began operating that portion of the new system in the district covered by the underground conduits. Extensions of the service were made rapidly during the following months, and by October, the entire public lighting was furnished by the municipal plant. There was at that time 1470 arc lamps mainly employed in street lighting, and 2456 incandescent lamps in the different municipal buildings. The system has continued to extend until on June 30, 1900, there were 2002 arc lamps and 6679 incandescent lamps in the municipal system of lighting; 440 arc lamps were grouped on 138 towers, but the greater number are now distributed in single locations.

FINANCES OF PLANT.

As a basis for comparison and discussion, the following tables showing the cost of lighting are presented from the reports of the public lighting commission. They include in the cost not only the operating expenses of the plant, but charges for interest on the investment, for annual depreciation of the plant, and for municipal taxes which would be collected were the plant owned by a private corporation. The items for operating expenses and interest on the investment present no difficult problems. The charge for lost taxes is estimated by charging the regular rate of taxation for city, county and state purposes on a valuation assessed on the same basis as other similar plants in the city; the assessed value of the municipal plant being about one half of the net investment. The charge for depreciation is made on the net investment at the rate of three per cent. The amounts charged for these two items seem to be reasonably adequate.

In some respects the figures given below vary from the statements in the reports of the commission. For the first two years, no attempt was made to include the items outside of operating expenses necessary to calculate the annual cost of the plant; and in 1897 the commission argued that the only item of depreciation that should be considered was on the cost of the boilers, as the rest of the plant was maintained in perfect condition by expenditures for repairs. But in the later reports the items of interest, depreciation and lost taxes have been considered as shown; and the corresponding data for 1896 and 1897 have been compiled by the writer on the same basis as the figures of the commission for subsequent years.

Again in their last report, after estimating the cost in the same form and with almost precisely the same results as in the table below, the commission presents a supplementary statement of items amounting to $10,000 which would reduce still further the total cost. At least some of these items might in fairness be deducted. The work of the commission has absorbed the former municipal supervision over private lighting companies, and their expenses thus include a certain amount chargeable to the general expenses of the city. The department also collects various sums of money for rentals and sale of old materials, which reduce the net expenses, but are not deducted from the total operating expenses. These items, however, have not been deducted in this paper, because they are not given for the years before 1900, and it seems better to present all the figures on the same basis. The effect of this is equivalent to increasing the allowance for depreciation.

FINANCIAL RESULTS OF THE DETROIT MUNICIPAL LIGHTING PLANT.

YEAR ENDING JUNE 30.	1896 9 MONTHS.	1897.	1898.	1899.	1900.
Capital expenditure.					
Total outlay.....	$640,130.85	$729,222.73	$790,145.73	$813,803.47	$828,088.00
Less depreciation allowances.....	.....	714,843.76	750,000.00	751,157.74	742,907.56
Annual Cost.					
Operating expenses	82,803.36	110.141.88	99,713.18	96,665.03	90,087.73
Interest at 4%	18,203.92	28,593.75	30,000.00	30,046.28	[1] 29.716.28
Depreciation at 3%..	14,402.94	21.445.30	22.500.00	22,534.71	22,287.22
Lost Taxes.....	4,800.00	7,981.43	8,368.00	7,828.00	7,013.06
Total.....	$120,210.22	$168,161.86	$160,581.18	$157,074.02	$149,104.28
No. of arc lamps.	1483	1564	1744	1868	1,963
No. of inc. lamps.	2456	3064	3901	4911	6,679
Kilowatt Hours.					
Arc lamps.....	2,108,680	2,716,628	2,975,019	3,182,293	3,327,453
Incandescent lamps.	177,548	263,784	306,596	357,274	461,597
Distribution of Cost.					
Arc lamps.....	$109,984.36	$153,174.14	$145,573.58	$141,256.00	$130,939.95
Incandescent lamps	10,235.86	14,987.68	15,007.60	15,818.02	18,164.33
Cost per arc lamp.	$74.16 (9 ms).	$100.50	$83.46	$75.62	$66.81
Cost per Kilowatt Hour.	98.88 per yr. $.052	$.056	$ .049	$.044	$ .040

[1] The Commission estimate the interest on the net investment at the beginning of the year ($728,623), but the new investment should be charged with interest for at least part of the year, and it seems better, to follow the method of former years and calculate the interest on the net investment at the end of the year.

RESULTS OF MUNICIPAL OWNERSHIP.

The first and clearest deduction from these figures is that the municipal plant has furnished public lighting to Detroit for a much smaller expenditure than would have been required under any alternative presented in the bid of the private company in 1893. The lowest rate proposed by the private company was $102.20 per arc lamp for a ten-year contract. The municipal plant furnished lights at appreciably less than this figure from the outset; and during the last three years the cost has fallen steadily until it is now less than two-thirds of the minimum price demanded by the company, with a probability of still further reductions before the ten year contract necessary to secure the minimum price would have expired. The direct financial results have thus fully justified the city of Detroit in establishing a municipal system of electric lighting.

Moreover, other beneficial results have followed from the new system. The rapid extension in the number of lights may be ascribed to the reduction in cost, which has allowed a smaller total expenditure to provide a large increase in the amount of lighting. But along with the increase in number of lamps, there has gone a noticeable improvement in the quality of the service, as indicated by the great decrease in number of lamps reported out by the police. In 1893–4, under the contract system, the total number of lamp-hours reported out was 86,426; since the municipal works have been in full operation, the largest number of lamp-hours out in one year has been 7,465.

DETROIT COMPARED WITH OTHER CITIES.

It must not be supposed that the conclusions thus far reached offer any basis for a generalization in favor of municipal lighting. The only fact shown is that Detroit has in the past five years secured better and cheaper lighting under its municipal system than could have been secured by a contract made in 1893. May it not be, however, that these results have been gained through improvements in electric lighting since 1893 which are not likely to be duplicated; so that while compared with the alternative of 1893 Detroit has gained, a private company might now offer lower prices than the city is paying. A decisive answer to this query is not easy to find. But it is possible to obtain some light on the subject by comparing the cost of Detroit lighting with the prices charged by

private companies for public lighting in other cities. There is an abundant supply of materi l for making such a comparison in the recently published report of the Commissioner of Labor on Water, Gas and Electric Lighting Plants. The statistics given on this report are for various dates from 1897 to 1899; and the Detroit report for the year ending June 30, 1898, will correspond most nearly to these varying dates.

For the year 1897–8, the cost of the Detroit municipal plant was at the rate of $83.46 for each arc lamp for 3786 hours in the year, or $.049 per kilowatt hour. An examination of the summary tables in the Labor Commissioner's report shows that no group of private companies charged for public lighting less than $.0514 per kilowatt hour; and that, when the hours of service are considered, no group charged so low a price per arc lamp as the cost in Detroit. From the detailed tables showing the statistics for each plant, the following table has been compiled including all the private plants reported which furnished 500 or more arc lamps for public lighting:

STATISTICS OF PUBLIC LIGHTING BY PRIVATE CORPORATIONS.

Plant Number.	Number of public arc lamps.	Hours of service.	Price per lamp per year.	Price per kilowatt hour.[1]	Total Investment in Plant.
889	860	4000	$147 93	$.0800	$609 129
893	513	3900	100 00	.0838	473,621
915	916	2216	74.50	.0731	450,000
918	1243	3988	120.34	.0631	664,267
922	984	3988	91.25	.0416	1,752,552
924	538	4000	138 70	.0771	875 335
925	510	4650	146 00	.0654	1,591 801
931	1173	3000	85 00	.0630	800.847
932	626	3960	85.00	.0477	1,170,859
933	1279	4000	91 25	.0507	1.250.000
934	860	3953	104 84	.0479	2,600 000
935	674	3878	75.00	.0569	836.157
936	2500	4000	100 00	.0500	1.975 000
937	927	3888	93.24	.0500	2 107.660
939	800	2685	103.00	.0833	1,341,100
940	958	3966	100 38	.0634	1,845,569
941	1390	4000	127.50	.0708	4.157 354
942	830	4000	116.27	.0781	850.000
943	702	3855	102.70	.0595	1,475.000
944	3647	4000	97.97	.0500	2,040 000
947	652	3210	176.55	.1273	2,773.904
948	2276	3940	127.31	.0630	3 145.541
949	1216	4000	86.09	.0476	2,683.875
951	2072	4000	96.00	.0505	1.961.551

[1] It should be noted that the figures of cost given in Tables 10 and 11 of the Commissioner of Labor's Report for municipal plants cannot be compared with the prices charged by private companies, given in the same tables. The cost for municipal plants does not include estimates for lost taxes or interest (see p. 549 of Report); and in some cases no adequate charge is made for depreciation. The estimated charges for lost taxes and interest are presented in Table 8; and it is difficult to understand why with this data at hand the serious error should have been made of leaving it out of consideration in computing the cost per arc light and per kilowatt hour.

It will be noticed that four of the twenty-four plants furnished lights at lower prices per kilowatt hour than the cost in Detroit for 1898, and that five others furnished lights at prices but slightly in excess; while in the remaining thirteen cases the prices are distinctly higher than the cost in Detroit.

These facts indicate that the city of Detroit has secured its public lighting through its municipal plant not only for much less than could have been obtained by contract in 1893, but also on terms which compare favorably with the lowest prices charged by private companies in other cities. It cannot be claimed, however, that the Detroit municipal rate shows any large advantage over the lowest private rates, while in one city a private company furnishes public lights at a price one-sixth lower than the Detroit lights cost. It should be remembered that the private companies have an important advantage in supplying electricity to private consumers within the same area as the public lighting, thus securing the economies of manufacture and distribution on a larger scale. If the Detroit municipal plant supplied the private demand, undoubtedly the cost of city lighting would be still further reduced. But viewing the existing situation, the fact of some private rates lower than the Detroit municipal rate must be recognized.

This comparison has been made on the basis of the cost of Detroit lighting for 1898. If the striking reductions in the Detroit figures during the last two years have been in large measure confined to this city, the cost of lighting has been reduced below the price charged by any private company in the above table, and the success of the municipal plant is strongly emphasized. It is probable, however, that at least some important reductions have been made at the same time in the cost and price of public lighting in other cities; and in the absence of definite data of recent date, for any large number of cities, it is not possible to make accurate deductions as to the comparative significance of the cost of Detroit lighting for the last two years.

The entire responsibility for the management of the Detroit lighting plant rests with the public lighting commission; and this paper would be incomplete without noting the character and methods of the commission, which have been essential factors in the success of the municipal plant. The commission consists of six members appointed by the mayor of the city with the consent of the council. These serve without salary for six year terms, one member retiring each year. This organization offers certain

advantages. The gradual renewal of the membership serves to ensure a continuous tradition and a steady policy in the management, while the absence of salary probably lessens the pressure of professional place hunters far appointments. But it is not everywhere an easy matter to find efficient commissioners for such boards; and the Detroit experiment has been highly favored in securing as members of the commission active business men who have been both able and willing to devote a large amount of time to this work. The character of the members can best be illustrated by the methods adopted.

In the first place the commissioners take an active personal part in the management. During the last two years the work of making purchases and contracts for supplies has been performed directly by committees of the board; and the savings made by this system account in large part for the reduction in operating expenses during these years. In the second place, the other expenditures have been throughout on a conservative and business basis. No expensive buildings have been constructed, and no extravagant salaries are paid. The general superintendent receives $2000 a year, two other officers have $1200 a year, and no others over $1000 a year. Yet the wages of the men are as high as in any business concern, and the eight hour day is in force. In the third place the tenure of positions are dependent solely upon efficiency, and a system of promotion in service according to merit and fitness for the work is employed.

In brief, this honorary commission manages the municipal lighting plant precisely as a board of directors would conduct the affairs of a well managed private corporation. Directors usually have a large pecuniary interest in the corporations which explains their active work for its financial success. Unsalaried boards of managers have, however, proven effective in the administration of educational and charitable institutions, both public and private, mainly on account of the philanthropic interest attached to the work. In our national administration, too, the dignity of a position in the president's cabinet secures for the direction of the army, navy and post-office, men whose services command in the business world many times the salary they receive from the government. A city which finds men willing to perform similar honorary service in the administration of a purely economic function has certainly made long strides towards the realization of municipal ideals.

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BOOK REVIEWS.

FINANCES OF PARIS.

Les Finances de la Ville de Paris de 1798 à 1900. Par GASTON CADOUX. Paris, Berger-Levrault & Cie., 1900. 8vo, 823 pp. Paper, 15 frs.

This book is probably the most extensive and elaborate study which has yet been made concerning the finances of any city. In fact, from the standpoint of the scientific student of finance as well as from that of the general reader, its great length and its extreme detail will even appear to be a fault. The work is much better suited to the use of the technical municipal administrator, and for such it was doubtless primarily intended. The author is himself a prominent officer in the actual financial administration of Paris, being secretary of the budget committee of the municipal council, and also secretary of the loan commission. His opportunities for obtaining facts have been the most complete. It is but natural that he should have been led, especially with a view to enlightening the officials of the city themselves, to present an enormous mass of details, which must seem to most readers wearisome, often confusing, and sometimes even absurd. Moreover the official position, as well as the apparent aim of the author, doubtless account for the fact that he has taken for granted, to a degree which is inconvenient at least to the foreigner, that the general organization of the city government, its history, and its relations to the state, are familiar to his readers. He fails to point out sufficiently the connection of the finances with other phases of the administration, and especially with the actual conditions and vicissitudes of municipal and state politics.

A final fault which may be found with the book before us is the almost entire absence of scientific theory and criticism. A few questions pertaining to the finances are indeed critically discussed, but for the most part our author preserves what he perhaps, in view of his official position, considers a discreet silence. This omission is the more noticeable because, with all its excellencies, there is much in the management of the municipal purse of Paris which scarcely conforms to well recognized canons of finance.

Despite these perhaps unavoidable defects, M. Cadoux's work is of very great value from every point of view. It makes accessible a vast mine of material as to the administration of the French capital, an administration which, by its remarkable successes, as well as by its occasional errors, furnishes so much of interest and instruction as to the art of municipal housekeeping. Indeed, we could wish that a summary of the entire book might be published in English for the benefit of those interested in good city government.

The first part of the book is historical. It describes the financial operations of *ancien* Paris, from 1798 to 1860, and, in greater detail, of modern Paris. Our author criticises very severely the extravagance, and especially the reckless methods of financiering, of the famous administration of Baron Haussmann as prefect of the Seine, from

1850 to 1870. Though Haussmann did so much to transform Paris into its modern dignity and beauty, he left the city burdened with a debt of 1,475,000,000 francs, large sums of which were in the form of floating obligations. The debt was further rapidly swelled during the terrible period of the siege and the commune, and by 1875 had reached a figure not greatly less than its present amount. Immediately after the establishment of the Republic, however, the capital was given an elective municipal council, in place of the appointed body which had hitherto been the pliant tool of the prefect of the Seine. This body, with all its weakness and its faults, has helped much toward the good government of Paris; and under its influence the finances of the city have moved on smoothly, without corruption, and with few changes in policy—a fact which makes the financial history somewhat uninteresting to the American, accustomed to the exciting play of party politics and corrupt rings in city affairs.

M. Cadoux, like most Parisians, evidently feels that the city council still has too little power over against the central government. His description of the method of voting the annual budgets shows clearly how powerful is the influence of the two chief executive officers, the prefect of the Seine and the prefect of the police, both appointed by the national authorities. These officers prepare the estimates of receipts and expenditures, and must be mainly relied upon for information. While the city council apparently gives more careful consideration to the budget than most American municipal legislatures do, it still complains that it has too little opportunity for deliberation and for securing information, and too little power. The national government indeed compels the inscription of not a few items in the budget; this is notably true of the expenditure for the police. Various financial measures proposed by the city require sanction by the state government; for example, all loans are authorized by special acts of the legislature.

The debt of Paris is enormous. M. Cadoux, somewhat curiously, treats the total of future interest as part of the present debt, and thus finds the entire amount of municipal obligations to be 4,839,000 000 francs or in round numbers $930,000,000. This includes the large sums to be paid as premiums or special allotments on the basis of periodical drawings among the creditors, in accordance with the common French custom. While the city has indeed much to show for money raised by loans, the annual charge of $22,000,000 for debt service, constituting more than one-third of the normal expenditure, is certainly a heavy one. We may at any rate question (a thing which our author almost wholly fails to do) the wisdom of the Parisian practice of making the usual term of municipal obligations 75 years. Certainly many, though of course not all, of the public works for which loans have been incurred will require great additional outlay, and perhaps entire reconstruction, long before the bonds originally issued have been redeemed. The most commendable feature of the debt management in Paris is the universal application of the principle of gradual and automatic redemption by including a part of the principal with each interest payment.

The tax system of Paris is far from satisfactory. The chief reliance is upon the octroi—consumption taxes levied on commodities brought into the city. More than half of the entire city revenues, and five-sixths of the revenues from taxation, come from this source, estimated for 1900 to produce over $32,000,000. The octroi represent a burden of about $12 yearly per capita. Our author presents an interesting table showing how much these taxes add to the prices of articles of common consumption. Ordinary grades of meat and fish pay from one to two cents per pound; butter and oleomargarine, one and one-half cents; coal and coke about seven cents per 100 pounds; while the rate on petroleum no less than nine cents per gallon. It is obvious that these taxes are unjust to the poorer classes. Fortunately a strong movement is

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under way for the substitution of other methods of taxation. Perhaps the most original and constructive part of the book before us is the discussion of these proposals. We may however question to what extent it is possible or just to carry out the suggestion made by our author himself, that special taxes, such as those already collected for street cleaning and for the use of sewers, be levied upon those classes particularly benefited by various public activities. The element of common benefit from all these services must not be underestimated.

Aside from the octroi, and the special taxes just mentioned, the other taxes in Paris are merely percentages added to the state imposts and collected by state officers. Far more interesting are the various receipts from public works and franchises. The gross revenue from these sources is more than $14,000,000, or 22.5 per cent of the entire municipal income. While this sum is not materially greater than New York obtains from similar sources, the net income, after deducting expenditures, is very much larger in the French metropolis than in New York. Unfortunately M. Cadoux does not bring the receipts and expenditures of these various services side by side, and entirely fails to present figures for the cost of debt service connected with particular enterprises. I have compiled the following table regarding the receipts and expenditures according to the budget of 1900.

	Gross receipts.	Expenditures except for debt service.
Public markets	$1,801,000	$705,700
Abattoirs	763,800	
Entrepots for wine and other products	384,600	75,100
Water supply and canals	3,584,600	1,161,500
Sewers, excluding tax	448,100	996,100
Cemeteries	477,100	349,300
Other city property	415,600	No expenditures properly corresponding.
Locations upon streets and in parks	882,100	
Cabs, omnibuses and street railways	1,644,000	
Other uses of streets	211,700	
Gas company	2,730,800	

Judging from the indications which are available as to the capital cost of the various revenue-earning enterprises of Paris, there is a net profit, over and above the interest on the capital invested, of from one-fourth to one-half of the gross receipts, from each of those services which involve outlay, except in the case of the water supply and the sewer system, which, in accordance with just financial principles, are made barely to pay their own charges. The receipts from the use of streets, from vehicles and street railways, and from the gas company, are especially noteworthy, though the large revenue from the latter source is partly at the expense of a very high price to consumers for gas.

The total ordinary expenditure of Paris for 1900 is about $62,000,000. The increase in outlay for the past 25 years has been moderate; the per capita amount rising from $20 in 1876 to $23 in 1900. The per capita expenditure of New York City, to be sure, decreased from $28 in 1869 to $24.60 in 1880 and $23 in 1896; but the figures for the earlier years in our own metropolis were excessively swollen by corruption. The most striking of the separate items of the Paris budget are these: the immensely rapid increase in the expenditure for public education, and the great variety of forms of technical and advanced instruction now offered by the city; the comparative moderateness of the sums spent for keeping up the splendid streets, boulevards and parks, and the still more excellent street cleaning service; the considerable expenditures for en-

couraging the fine arts; and the relatively large outlay for public charities of various sorts.

Perhaps the most interesting feature of M. Cadoux's book is the concluding essay on the comparative financial statistics of leading cities throughout the world. While he confesses that the wide differences in conditions make it difficult to draw conclusions from the statistics, and while the different methods of accounting make the figures themselves often incomparable or of doubtful accuracy, an immense amount of valuable information is given. An illustration of the difficulty of comparison is seen in the fact that M. Cadoux's figure for the debt of Paris, by including future interest, appears unduly large as compared with the statistics of other cities. Again we notice that Greater New York is said to have an annual debt charge of no less than $40,000,000. This sum is much too large, but it is little wonder that our author was unable to disentangle the correct figure from among the infinite complexities of the financial statements of the great American city.

Within the limited space of a review it is impossible to comment further on the many important facts brought forth in this book. It is to be hoped that studies of a character somewhat similar to that which M. Cadoux has given us for the French capital may soon be forth-coming concerning the financies of our own leading cities, as well as of those of other countries. Nothing can contribute more to promote good city administration than thorough knowledge regarding the financial experiences of other municipalities.

Washington, D. C. E. DANA DURAND.

POLITICS AND ADMINISTRATION.

Politics and Administration. By FRANK J. GOODNOW, A.M., LL.D. New York, The Macmillan Company, 1900. 12 mo, 270 pp. Cloth, $1.50.

If a modern publicist were asked what was the most important change taking place in the internal politics of America at the present time, he might well answer, the increase in the importance of executive power. No other development in our political life can compare with the unprecedented extension of administrative functions within recent years. The causes of this extension are largely, if not wholly, economic in character, and for this reason, perhaps, the change has taken place gradually and almost unconsciously. Professor Goodnow's attention was early attracted to the new development, and he has given us a series of valuable books upon the subject. In all of these works the dominant thought is the increasing importance of administrative functions in government, so that Professor Goodnow, more than any other American, may be said to represent administrative science. In his latest work he has attempted to show the relation of administration to politics and the reciprocal influences of these forms of activity on each other. "Politics has to do with policies or expressions of the state will. Administration has to do with the execution of these policies." (Page 18).

After discussing in Chapter I the necessity of describing the actual as well as the nominal or formal sides of American government, the author explains in Chapter II how the making and enforcement of the law must harmonize with each other. The administrative side must be subordinate to the political. Parties have a two-fold object; first, to secure the expression of the popular will in making laws, and second, to control in a general way the sympathetic execution of these laws, that is, the administration. Now, in America parties not only control administration in a general way, but they actually carry on the administration in detail. Nearly all administrative

officers have therefore become political in character. As a result of this attempt of the party to perform more work than it should, American parties are no longer responsible to the people except in times of crises. In order to carry on the gigantic work which Americans have imposed on it, the party has been so strengthened and centralized that practically all power has been taken from the individual members of the party and placed in the head or "boss." This is especially the case where the administrative organization of the government is decentralized. In these cases each local official elected by the people must be controlled by the party and this can only be done by a thoroughly organized semi-military type of party; hence the growth of "boss" government which is notoriously irresponsible. The author devotes two chapters (VIII and IX) to "The Boss" and the "Responsibility of Parties," respectively. These portions of the work are full of valuable and suggestive thought. By far the most interesting part of the book, however, is the last chapter, in which Professor Goodnow draws his conclusions. The first thought is that a thorough centralization of the administration is necessary in order to make it possible for the latter to become efficient and to attain some slight degree of independence over absolute party domination. Civil service reform has been preceded by administrative centralization. Only with this centralization has there come the possibility that one man may be held responsible for the use of administrative power. The president in the United States and the mayor in the city have each, in his sphere, come to be held accountable for the execution of the laws.

The second conclusion is that centralization is not enough of itself to insure responsibility to the people or popular government. In order to secure popular government we must give some definite legal recognition to the party and to the party boss. This has been accomplished in England by the union of the executive and legislative powers of the government, but the author declares such a union to be practically impossible in the United States, owing to our deep rooted admiration for the theory of the separation of powers. Such a union, if it is to take place at all, must be effected through the party. Professor Goodnow believes that the party boss may be made responsible to the party largely through legal regulation of party primaries in such way as to secure the rights of the individual member of the party, and by laws requiring full publicity of all disbursements of money. He also points to the effects of the referendum in securing the separate judgment of the people on each question submitted to them, thus avoiding that wholesale acceptance of obnoxious party platforms which is necessary at the present time in order to secure the adoption of one desirable plank. Striking instances of this evil are seen in the platforms of both parties during the recent campaign. The changes suggested by Professor Goodnow would doubtless be of great assistance in improving our political conditions. The centralization of our administrative organization in state and city along the lines already marked out in some recent laws would prove especially helpful in this respect, as would also the adoption of the referendum. But if we are to stop here, our fundamental political evils will still remain. The great question which Professor Goodnow has not entirely solved is, How shall the party leader be made responsible? There appears at present to be only one way to do this, viz., by inducing him to accept office. No system of *primaries* yet invented can deprive the leader of his despotic power, nor render him responsible to any considerable degree. We are living in an age of highly concentrated power, and to render the holders of power responsible we must force them to become candidates before the people. Professor Goodnow admits that a union of the executive and legislative powers must take place under the control of the leader, but thinks that such a union in America must be accomplished inside the party. Unless some hitherto

unknown means of making the boss responsible to the party is discovered, however, the abandonment of the theory of separation of powers will be forced upon us. It is in reality less a question of abandoning this theory than of recognizing that we have already abandoned it in substance. Those who are interested in these important practical aspects of our political institutions will find additional discussions of the subject in Henry J. Ford's valuable book, "The Rise and Growth of American Politics," Clinton Rogers Woodruff's article "American Political Methods," in the Political Science Quarterly, June, 1900, and in the reviewer's "Liberty *versus* Efficiency," Yale Review, November, 1899.

University of Pennsylvania. JAMES T. YOUNG.

MUNICIPALIZATION IN THE UNITED STATES.

Fourteenth Annual Report of the Commissioner of Labor, 1899. *Water, Gas, and Electric-Light Plants under Private and Municipal Ownership.* Washington, 1900. 8 vo, 983 pp.

This report calls for only a brief notice, because the work is already in the hands of every person who is deeply interested in the controverted subject of private versus municipal ownership and control of public service industries. The volume which the Department has given us contains the formulated results of the first attempt that has ever been made to collect and collate the statistics of all the water, gas and electric plants in the country, with the definite purpose of throwing some light upon this question. With the co-operation of the various state bureaus of labor, there have been brought together approximately the statistics of twenty-five per cent of the private and thirty-seven per cent of the municipal water-works; thirty-eight per cent of the private and seventy-nine per cent of the municipal gas-works; and twenty-five per cent of the private and seventy per cent of the municipal electric light plants of the country. So that it may be assumed that the report represents all that can be done under existing conditions to collect statistics of this kind covering the entire country.

As a whole, the results accomplished will prove a disappointment to many who had hoped to find the relative merits of the two systems of public service determined by this investigation. The report frankly recognizes that the facts presented do not and cannot settle this question conclusively, and it may as well be said that students of this problem realized before the report was prepared that under present conditions no other conclusion could be expected. If the report is to exert a beneficial influence upon the discussion of the problem which it undertook to solve, it will come through the acceptance of this fact that the statistical argument at best is inconclusive and misleading. But it is in the failure of many of those who may make use of the report to realize this fact that the danger lies. In the analyses of the several tables, certain generalizations are made concerning the relative cost and price of service under private and municipal control which tend to show the superiority of the latter system. Assuming that the statistics are in all cases correct, we may well doubt in several instances whether the superior showing of the one system in a given group is not due primarily to a failure to include a number of plants under each system sufficient to make the comparison valid. While these limitations are recognized in the report itself and will be accepted by all persons accustomed to the use of statistics, we may look for the appearance in the near future of a flood of ill-considered statements based upon the apparent showing of these comparative tables and supported by the authority of quotations from the analyses.

The statement of the report that the statistics of individual plants, moreover, may

not always be reliable can be readily accepted by those who understand the uniform weakness in the methods of book-keeping in the smaller cities and villages and the unwillingness, on the other hand, of private companies to give an accurate return of the financial details of their business. Because of these conditions, it would seem that the time has come for the several states to extend their administrative machinery to a solution of this problem by requiring uniform reports from water, gas and electric light companies, whether under private or municipal ownership. It is safe to say that the work done by the Massachusetts Electric Light Commission in a given year will shed a stronger light of valid argument upon the relative merits of the two systems than will the report which we have under discussion.

Within these limitations, which are due essentially to the difficulty of the task, the work has been well done. That the investigation was not exhaustive nor the results conclusive is not to be charged against the compilers. The report has demonstrated the pressing need in the immediate future of uniform and accurate statistics of these public service industries to be collected under the supervision and control of our state governments. Not until this is brought about can we expect to have statistics upon which we can base valid conclusions as to the relative merits of private and municipal ownership of these industries.

University of Illinois. C. W. Tooke.

URBAN HOUSING.

Houses for the Working Classes: How to Provide them in Town and County. (Seven papers read at a national conference on the housing question at London.) London, P. S. King & Son, 1900. 12 mo, 48 pp.

The seven papers contained in this pamphlet were read and discussed at a national conference held at London on March 1, 1900, and participated in by about four hundred representatives from county and borough councils, vestries, urban and rural district councils, trade unions and other bodies interested in the housing question in England. The papers were as follows: "Bad Housing in Rural Districts," by Clement Edwards; "Laborers' Cottages," by Miss Constance Cochrane; "Facts as to Urban Overcrowding," by Dr. Edward Bowmaker; "The Existing Situation in London: Statistics of the Problem," by Mrs. R. C. Phillimore; "Power of Local Authorities," by Councilor W. Thompson; "Consideration of Practical Difficulties as Regards Building," by Councilor H. C. Lauder; "General Principles," by Councilor F. Lawson Dodd.

These papers were all prepared by persons who have had practical experience in dealing with the housing question either as private investigators or as public officials, and, taken together, they present a quite complete account of the actual housing conditions in England, both urban and rural, at the present time, with an exposition of the weak points of existing legislation, particularly the Housing of the Working Classes Act of 1890.

It is evident from these papers, that much needs to be done in the way of improved housing in England, notwithstanding the above mentioned act. Overcrowding still exists to an alarming extent, and where insanitary areas have been cleared under this act, a failure to properly accommodate the displaced tenants, has too often caused house famines, and compulsory improvements have been followed by higher rent rates, resulting in overcrowding and the creation of new slum districts in the places of those destroyed. Two of the papers deal with a subject not often discussed in this connection, namely, housing in the rural districts. It appears that in certain sections of England there is a sad need of proper housing accommodations among farm laborers, and of legislation for their protection as tenants.

As a result of this conference a national committee was formed for the purpose of watching a housing bill now before Parliament, and of impressing upon that body the absolute need for certain reforms. The conference also made, among others, the following suggestions, all of which are discussed in one or the other of the above mentioned papers: (1) that the local authorities be empowered to hold land outside their areas for future needs, and that they be empowered to acquire land compulsorily on the basis of assessable value and to hold the same for the purpose of providing better housing facilities; (2) that the rural district councils be empowered to acquire land cheaply and easily for building, without the sanction of any other body than the Local Government Board; (3) that the period of repayment of building loans be extended; (4) that grossly insanitary property be compulsorily acquired at the values of the materials and of the land, subject to the obligation to build thereon; (5) that in the case of rural tenants, a notice to quit of at least three months be made compulsory, etc., etc.

The pamphlet also contains a well arranged and well selected bibliography of the housing question in general, prepared by the Hon. Sidney Webb, L.C.C.

Washington, D. C. GUSTAVUS A. WEBER.

PUBLIC CONTROL OF CORPORATIONS.

Corporations and Public Welfare. Addresses at the Fourth Annual Meeting of the American Academy of Political and Social Science, April 19–20, 1900. Philadelphia, American Academy of Political and Social Science, 1900. 8vo, 208 pp. Paper, $1. New York, McClure, Phillips & Co. 12 mo. Cloth, $1.50.

This remarkable volume of addresses on the fundamental problem of political science in the present age is divided into four divisions, dealing with four phases of the general problem. These are "The Control of Public Service Corporations," "Influence of Corporations upon Political Life," "Combination of Capital as a Factor in Industrial Progress," and "The Future of Protection." The last two topics do not fall directly within the scope of MUNICIPAL AFFAIRS, and will therefore be little more than referred to in this review.

In his introductory address, Prof. L. S. Rowe, of Philadelphia, gives a careful analysis of the general principles involved in the relations between civic authorities and corporations performing specific public services. He gives a new expression to the idea that government exists for the people, not the people for government. This idea has peculiar significance when applied to municipal affairs, for the industrial and social city is always overflowing the boundaries of the municipal corporation. The city is, too, more than a district of congested residences—it is a flexus of wide-reaching social and economic interests. Indeed, certain semi-public enterprises, such as the electric street railway business and the distribution of water, once local *par excellence*, have recently expanded beyond city limits, and are beginning to require the attention of a wider political unit than the municipality.

In summarizing his address, Prof. Rowe says:

"An attempt has been made to show that the municipal public service industries must be considered in their relation to the industrial progress and social welfare of the community and that the relation between the municipality and the corporations performing these services must be adjusted with this end in view. Pecuniary return must be subordinated to quality and cost of service. Keeping both of these in view, it is evident that the old opposition to combination and monopoly in this class of services is out of harmony with the best interests of the community. Finally, the changes in the conditions of these industries themselves have threatened, and promise still further to

undermine the efficiency of municipal control. In the readjustment which must soon be made, municipal control must be subordinated to the larger interests of the state.

Comptroller Bird S. Coler, of New York, in his address, the second of this series, treats in a rather unsatisfactory way the problems of the financia control of public service corporations with particular reference to over-capitalization. The character of his reasoning is well illustrated by his discussion of the tax upon gross receipts. He thinks that this tax, if universally adopted, would enable the municipality to steer clear of the whole problem of capitalization, "excepting where a readjustment of percentages is deemed necessary, or municipal ownership of these corporations is proposed." The Comptroller is in line with scientific thought in the advocacy of uniformity and publicity of accounts for public service corporations.

The third address, by Prof. John H. Gray, of Northwestern University, gives a detailed and somewhat disheartening account of the efforts made by the city of Boston and the State of Massachusetts to control the companies which have supplied gas to the metropolitan district of New England. Thus far, it seems, the companies have been able to out-general the state commission with its statutory limitations. Says Prof. Gray:

"The very thing which has caused commission control to yield such meagre fruits in Massachusetts would be sure to make public ownership give still less desirable results. Has commission control been so complete a failure as to cause us to despair of the whole problem? This is too large a question to enter upon here. Suffice it to say that to despair here is to despair of all self-government as we understand that phrase. I venture the prediction, however, that if the problem is capable of solution, it must be settled along the lines of the work of the Massachusetts Gas Commission. For if my diagnosis of the evils to be eradicated and of the difficulties encountered by the commission is correct, it follows that the difficulty comes ultimately from the dependence of the commission upon the ignorance of the voter. It follows necessarily that the only possible remedy is the political, administrative, and industrial education of the voter and through him of the legislator."

In the next address, Dr. F. W. Speirs, of Philadelphia, discusses the street railway question. His financial conclusion is as follows:

"Our experience would seem to indicate that the ideal system of adjusting the relations of the municipality and street railway corporations, if we are to retain private management, is public ownership of tracks with private operation under a term contract for a period not exceeding twenty years. The contract should stipulate the lowest possible fare which promises a reasonable return on investment and should provide for a progressive tax on gross receipts."

In Dr. Speirs' opinion the prodigality of American cities in granting franchises has brought, along with its grave evils, certain large social benefits to be seen in the better equipment and more extended service of street railways in America than in Europe.

Senator William Lindsay, of Kentucky, whose address was upon the "Influence of Corporations on Political Life," after apologizing, in a way, for the part which corporations take in political affairs, makes this statement:

"I may say with reasonable confidence that nine-tenths of the corporations now engaged in shaping public opinion would welcome the opportunity to abandon that policy and gladly confine their attention and devote their moneys to none other than the purposes of their creation. If they could be relieved from the annoyances and dangers attending the attacks of the place-hunter and the professional agitator, and be protected against the demands of greedy party bosses in charge of party organizations,

they would submit without remonstrance to all proper restraints and forget their past political affiliations in the more energetic prosecution of their corporate business."

Yet the Senator admits that there are corporations which "first make themselves parties to combinations, having in view the control of particular lines of business, or the creation of monopoly, and then seek through political manipulations to protect themselves against the action of the legislatures and the judgments of the courts." In the following sentences the Senator strikes at the core of the problem:

"Whatever reduces or minimizes the importance of the individual diminishes the sense of responsibility and weakens the force of the obligations of duty that would otherwise impel every conscientious man to their due observance. So long as we unhesitatingly submit ourselves to the necessary tendency of this diminution of personal responsibility, we surrender our convictions of duty in politics to the policies and necessities of our party, and in organized business adventures, we surrender them to corporate interests and advantages. We look to dividends rather than to the approval of a good conscience, and hear with complacency, instead of resenting with indignation, the common witticism, that a corporation is a body without a soul."

Of the remaining addresses perhaps the most significant are the one by James B. Dill, Esq., of New York, on "Industrials as Investments for Small Capital," and the one by Hon. John Wanamaker, on "The Evolution of Mercantile Business," the latter being a defense of the department store. The addresses here reviewed do not tend to relieve one of anxiety for the future of free government. They point no easier way to success than the age-long process of strenuous effort and education through repeated failure.

Elk Rapids, Mich. DELOS F. WILCOX.

BRIEF NOTICES.

The Coming Democracy, by Orlando J. Smith (New York, The Brandur Co., 1900. 12mo, 162 pp. Cloth, $1.) is a stimulating, vivacious little work written by one who is a firm believer in democracy and who attributes such evils as at present exist to defects in governmental forms rather than the democratic theory of government. The author argues in a convincing way for a simpler governmental organization, a more direct and immediate relationship between people and officials, fewer instances of indirect election, shorter terms of office, direct nomination, proportional representation and municipal home rule. Those who do not agree with the conclusions reached may criticise the work because of the constant comparison of municipal with private corporations, and the tendency to use analogy where there is little similarity.

Of a similar character is *The Machine Abolished and Restored to Power*, by Dr. Charles C. P. Clark (New York, Putnam's Sons, 1900. 12mo, 196 pp. Cloth, $1.) This work, in substance, was printed several years ago but did not receive the attention it deserved, except in a small circle. Fortunately for those interested in municipal problems, it is now available to all. Dr. Clark's plan, which is based upon the idea that the existence of the machine is due to an imperfect election system, involves the formation of small primary assemblies in which the voter may become acquainted with the man he votes for, with the duties which the candidate, if elected, will discharge and with his ability to do so. Doubtless Dr. Clark has in mind the excellent results of the old town meeting system in New England but does not appreciate to the full extent the great difference between the present city and the old New England town, and the difficulties such a scheme would encounter. The book is well worth careful reading. It states in a pleasing and striking way many suggestive ideas.

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The Engineering Record has added another useful work to its list of valuable publications. *Water Works for Small Cities and Towns*, by John Goodell (New York, Engineering Record, 1899. 8vo., 286 pp. Cloth, $2), is replete with information never before collected into such an available volume, and will be found of great use to water-works officials in villages and small cities. Many others will also find it well worth perusal.

Municipal Improvements; A Manual for the Municipal Official, by W. F. Goohue (3rd edition. New York, Wiley & Sons, 1900. 12 mo, 207 pp. Cloth, $1.25), is another useful volume, which aims to cover the whole ground of municipal engineering. It does not enter into great detail, the object being to present the most important facts in a very brief and general way so that the average person unacquainted with technical details can learn something of engineering matters without being an engineer.

Similar in character are two recent works upon sewage disposal: *The Purification of Sewage*, by Sidney Barwise (New York, Van Nostrand Co., 1899. 12 mo, 150 pp. Cloth), and *The Separate System of Sewerage*, by Cady Staley and George S. Pierson (New York, Van Nostrand Co., 1899. 8 vo, 324 pp. Cloth, $3.) The former of these two works is more general in character and does not go so fully into detail as the latter, but deals chiefly with the chemical and biological principles involved, being the results of experience gained as medical officer of health in Derbyshire, Eng. The work by President Staley and Mr. Pierson is much more complete, although it does not attempt to cover the whole field. Its object is to explain the "separate system," to give practical directions for designing and constructing sewers in accordance with that system, and to show what results have been secured wherever it has been tried. The work is now passing through its third edition which indicates the warm reception accorded to it and its recognized value.

Street Pavements and Paving Materials, by George W. Tillson (New York, Wiley & Sons, 1900. 8 vo, 532 pp. Cloth, $4.) We feel perfectly confident in recommending this work to the student, the engineer and the city official, as it is a comprehensive and well executed attempt to show the various methods of solving street paving problems, and to point out how the best results can be obtained. The book is, of course, largely technical in character and primarily designed for city officials and those who have to deal with the technical problems. But its usefulness is by no means confined to this class.

The Law of Electric Wires in Streets and Highways, by Edward Quinton Keasbey (Chicago, Callaghan & Co., 1900. 8 vo, 358 pp.), is, as the title indicates, a purely legal work and one that has met a well felt want. It is now in its second edition. The author goes very thoroughly into court decisions and legal enactments. The chapters of greatest interest to general readers are those upon "Franchises—Legislative and Municipal" and "Municipal Control." Excellent legal works upon this subject are very scarce and the one before us deserves warm recommendation.

BIBLIOGRAPHICAL INDEX.

KEY TO ABBREVIATIONS.

BRITISH AND AMERICAN PERIODICALS.

American Architect, Boston	W	Am. Arch.
American Ecclesiastical Review, New York	M	Am. Ecc. R.
American Economic Association Publications, New York	B-M	Am. Econ. Assoc.
American Electrician, New York	M	Am. Elec.
American Federationist, Washington	M	Am. Fed.
American Gas Light Journal, New York	W	Am. Gas Light J.
American Historical Review, New York	Q	Am. Hist. R.
American Journal of Science, New Haven	Y	Am. J. Sci.
American Journal of Sociology, Chicago	Q	Am. J. Sociol.
American Law Review, St. Louis, Mo.	B	Am. Law R.
American Monthly Review of Reviews, New York	M	Am. R. of Rs.
American Public Health Association, Concord, N. H.	Q	Am. P. H. Assoc.
American Statistical Association Publications Boston	Q	Am. Statis. Assoc.
Annals of the American Academy of Political and Social Science, Philadelphia	B-M	Ann. Am. Acad. Pol. Sci.
Architect, London	W	Arch.
Architectural Record, New York	Q	Arch. Rec.
Architectural Review, Boston	S-Q	Arch R.
Architecture and Building, New York	W	Arch. & Buil.
Arena, Boston	M	Arena.
Atlantic Monthly, Boston	M	Atlan.
Banker's Magazine, London	M	Bank. M. (L.)
Banker's Magazine, New York	M	Bank. M. (N. Y.)
Bibliotheca Sacra, Oberlin, O.	Q	Bib. Sacra.
Blackwood's Magazine, Edinburgh	M	Blackw.
Board of Trade Journal, London	M	Bd. Trade J.
British Architect, London	W	Br. Arch.
Builder, London	W	Builder.
Bulletin of the Department of Labor, Washington	B-M	B. Dept. Labor.
Canadian Architect, Toronto	M	Can. Arch.
Canadian Electrical News, Toronto	M	Can. Elec. N.
Canadian Engineer, Montreal	M	Can. Eng.
Canadian Magazine, Toronto	M	Canadian M.
Cassell's Family Magazine, London	M	Cassell's.
Cassier's Magazine, New York	M	Cassier's.
Century, New York	M	Cent.
Chamber's Journal, Edinburgh	M	Chamber's.
Charities Review, New York	M	Char. R.
Charity Organization Review, London	M	Char. Or. R.
Chautauquan, Cleveland, O.	M	Chaut.
City and State, Philadelphia	W	City & State.
City Record, Boston	W	City Rec.
Commons, The, Chicago	M	Commons.
Commonwealth, New York	W	Commonw.
Consular Reports, Washington	M	Cons. Rep.
Contemporary Review, London	M	Contemp.
Cornhill Magazine, London	M	Cornhill.
Cosmopolitan, New York	M	Cosmopol.
Dial, Chicago	S-W	Dial.
Direct Legislation Record, Newark, N. J	M	Dir. Leg. Rec.
Dublin Review, London	Q	Dub. R.
Eclectic Magazine, New York	M	Ecl. M.
Economic Journal, London	Q	Econ. J.
Economic Review, London	M	Econ. R.
Economist, Chicago	W	Economist.
Edinburgh Review, Edinburgh	Q	Ed. R.
Education, Boston	M	Educa.
Educational Review, London	M	Educa. R. (London.)
Educational Review, New York	M	Educa. R. (N. Y.)
Electrical Engineer, London	W	Elec. Eng. (L.)
Electrical Engineering, Chicago	M	Elec. Engng.
Electrical Review, New York	W	Elec. R.
Electrical World and Electrical Engineer, New York	W	Elec. W. & E.
Electrician, London	W	Elec'n.
Electricity, London	W	Elec'y (L.)
Engineer, The, London	W	Eng.

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Engineering, London	W	Engng.
Engineering Magazine, New York	M	Engng. M.
Engineering News, New York	W	Engng. N.
Engineering Record, New York	W	Engng. Rec.
English Historical Review, London	Q	Eng. Hist. R.
Fire and Water, New York	W	Fire & W.
Fortnightly Review, London	M	Fortn.
Forum, New York	M	Forum.
Gas World, London	W	Gas W.
Green Bag, Boston	M	Green B.
Gunton's Magazine, New York	M	Gunton's.
Harper's Magazine, New York	M	Harper's M.
Harper's Weekly, New York	W	Hrprs. Wkly.
Illinois Society of Engineers and Surveyors, Peoria		Ill. Soc. Eng.
Independent, New York	M	Ind.
Indian and Eastern Engineer, Calcutta	W	Ind. & East. Eng.
Indian Engineering, Calcutta	W	Ind. Engng.
International Review, New York	M	Internat. R.
Johns Hopkins University Studies in History, etc., Baltimore.		J. H. Univ. Studies.
Journal of the Association of Engineering Societies, Philadelphia.	M	J. Assoc. Engng. Soc.
Journal of the Department of Labor, Wellington, New Zealand	M	J. Dept. Labor.
Journal of Finance, London	M	J. Finance.
Journal of the Franklin Institute, Philadelphia	M	J. Frankl. Inst.
Journal of Gas Lighting, London	W	J. Gas Light.
Journal of the New England Water-Works Ass'n, New London, Conn.	Q	J. N. E. W. W. Assoc.
Journal of Political Economy, Chicago	Q	J. P. E.
Journal of the Royal Statistical Society, London	Q	J. R. Stat. Soc.
Journal of the Sanitary Institute	M	J. San. Inst.
Journal of Social Science, Boston	Y	J. Soc. Sci.
Journal of the Society of Arts, London	W	J. Soc. Arts.
Journal of the Society of Comparative Legislation, London	Q	J. Soc. Comp. Leg.
Journal of the Western Society of Engineers, Chicago	B-M	J. W. Soc. Eng.
Kindergarten Magazine, Chicago	M	Kindergarten M.
Labor Bulletin of the Commonwealth of Massachusetts, Boston.	Q	Labor Bulletin, Mass.
Law Magazine and Review, London	M	Law M. & R.
Leslie's Weekly, New York	W	Leslie's Wkly.
Library Journal, New York	M	Lib. J.
Lippincott's Magazine, Philadelphia	M	Lippinc.
Literary Digest, New York	W	Lit. Dig.
Longman's Magazine, London	M	Longm.
Macmillan's Magazine, London	M	Macmil.
McClure's Magazine, New York	M	McClure's.
Merchant's Association Review, San Francisco, Cal.	M	Mchts. Assoc. R.
Municipal Engineering, Indianapolis, Indiana	M	Mun. Engng.
Municipal Journal and Engineer, New York	M	Mun. J. & Engr.
Municipal Journal and London, London	W	Mun. J. & London.
Municipal and Railway Record, New York	M	Mun. & Ry. Rec.
Municipal World, St. Thomas, Ont.	M	Mun. World.
Munsey's Magazine, New York	M	Munsey's.
Nation, New York	W	Nation.
National Review, London	M	National R.
New Century Review, London	M	New Cent. R.
New England Magazine, Boston	M	New Eng. M.
New Review, London	M	New R.
New York Education, Albany	M	N. Y. Educa.
Nineteenth Century, London	M	19th Cent.
North American Review, New York	M	No. Am.
Open Church, New York	Q	Open Church.
Open Court, Chicago	M	Open Court.
Our Country, New York	M	Our Country.
Our Day, Boston	M	Our Day.
Outlook, New York	W	Outlook.
Overland Monthly, San Francisco, Cal.	M	Overland.
Park and Cemetery, Chicago	W	Park & Cem.
Political Science Quarterly, New York	Q	Pol. Sci. Q.
Popular Science Monthly, New York	M	Pop. Sci. Mo.
Proceedings of the Engineers' Club, Philadelphia	Q	Pro. Eng. C.
Progressive Age, New York	W	Prog. Age.
Public Opinion, New York	W	Pub. Opin.
Publications of the Southern Historical Association, Washington.		Pub. So. Hist. Ass'n.
Quarterly Journal of Economics, Cambridge, Mass.	Q	Q. J. E.
Quarterly Review, London	Q	Quar. R.
Railroad Gazette, New York	W	Railroad Gaz.
Railway World, London	M	Ry. World.
Real Estate Record and Guide, New York	W	Real Estate Rec. & G.
Review of Reviews, London	M	R. of Rs. (Eng.)
Sanitarian, Brooklyn	M	Sanitarian.
Sanitary Journal, Glasgow	M	San. J.
Sanitary Record, London	W	San. Rec.
Saturday Review, London	W	Sat. R.
Scientific American, New York	W	Sci. Am.
Scientific American Supplement, New York	W	Sci. Am Sup.
Scottish Review, London	Q	Scottish R.

Scribner's Magazine, New York	M	Scribner's.
Self-Culture, Akron, Ohio	M	Self-Cult.
Spectator, London	W	Spec.
Strand Magazine, London	M	Strand.
Street Railway Journal, New York	M	St. Ry. J.
Street Railway Review, Chicago	M	St. Ry. R.
Transactions of the American Institute of Electrical Engineers, New York	M	Trans. Am. Inst. Elec. Engr.
Transactions of the American Society of Civil Engineers, New York	M	Trans. Am. Soc. Civ. Engrs.
Westminster Review, London	M	Westm.
Yale Review, New Haven, Conn.	Q	Yale R.

FOREIGN PERIODICALS.

Allgemeines Statistisches Archiv, Tübingen	S-Y	All. Stat. Ar.
Annales D'Hygiene Publique, Paris	M	Ann. D'Hyg. Pub.
Annales des Sciences Politiques, Paris	M	Ann. Sci. Pol.
Annales des Travaux Publics de Belgique, Brussels	Bi-M	Ann. Travaux Pub.
Arbeiterfreund, Berlin	Q	Arbeit.
Archiv für Eisenbahnwesen, Berlin	B-M	Ar. Eisenbahn.
Archiv für Oeffentlicher Recht, Freiberg	Q	Ar. Oef. Rt.
Archiv für Soziale Gesetzgebung und Statistik, Berlin	B-M	Ar. Soz. Gesetz. Stat.
Bibliotheque Universelle, Brussels	M	Bib. Univ.
Deutsche Bauzeitung, Berlin	B-W	Deut. Bau.
Deutsche Revue, Stuttgart	M	Deut. R.
Deutsche Rundschau, Berlin	M	Deut. Rund.
Devenir Social, Paris	M	Dev. Soc.
Elektrotechnische Zeitschrift, Berlin	M	Elek. Zeit.
Espana Moderna, Madrid	M	Esp. Mod.
Finanz-Archiv, Stuttgart	S-Y	Finanz-Ar.
Génie Civil, Paris	W	Génie Civil.
Gesundheits Ingenieur, Munich	B-W	Gesund.-Ing.
Giornale Degli Economisti, Roma	M	G. Degli Econ.
Historische Vierteljahrschrift, Leipzig	Q	Hist. Vier.
Historische Zeitschrift, Munich and Leipzig	Q	Hist. Zeit.
Historisches Jahrbuch, Munich	Q	Hist. Jr.
Jahrbuch für Gesetzgebung Verwaltung und Volkswirtschaft in Deutschen Reich, Leipzig	Q	Jr. Gesetz. Ver. Volks.
Jahrbücher für Nationalokonomie und Statistik, Jena	Q	Jr. Nat. Stat.
Journal des Economistes, Paris	M	J. Economistes.
Nouvelle Revue, Paris	S-M	Nouvelle R.
Nouvelle Revue Historique, Paris	B-M	N. R. Hist.
Nuova Antologia, Rome	S-M	Nuova Ant.
Preussische Jahrbücher, Berlin	M	Preus. Jr.
Reforma Sociale, Turin	M	Reforma Soc.
Réforme Sociale, Paris	M	Ref. Soc.
Revue Bleue, Paris	W	R. Bleue.
Revue de Deux Mondes, Paris	S-M	R. Mondes.
Revue de Droit Publique, Paris	B-M	R. Droit Pub.
Revue D'Économie Politique, Paris	M	R. Econ. Pol.
Revue Generale, Brussels	M	R. Gen.
Revue Internationale de Sociologie, Paris	M	R. Int. Sociol.
Revue de Paris, Paris	S-M	R. Paris.
Revue Pédagogique, Paris	M	R. Ped.
Revue Pénitentiaire, Paris	B-M	R. Pen.
Revue Politique et Parliamentaire, Paris	M	R. Pol. e. Par.
Revue des Questions Historiques, Paris	M	R. Ques. Hist.
Revue des Questions Scientifiques, Brussels	W	R. Ques. Sci.
Revue des Revues, Paris	S-M	R. Revs.
Revue Scientifique, Paris	W	R. Sci.
Revue Socialiste, Paris	M	R. Soc.
Revue Technique, Paris	B-W	R. Technique.
Revue du Travail, Brussels	M	R. Travail.
Riv sta Internacional, Madrid	M	Riv. Inter.
Rivista D'Italia, Roma	M	Riv. D'Is.
Rivista Italiana di Sociologia, Roma	B-M	Riv. It. Sociol.
Schweizerische Bauzeitung, Zürich	W	Schweiz. Ban.
Scienza Sociale, Milan	B-M	Sci. Soc.
Staats-und Socialwissenschaftliche Forschungen, Leipzig	Q	Staats-Soc. Forschungen.
Staats und Völkerrechtliche Abhandlungen, Leipzig	Q	Staats-Völk. Abhand.
Statistik Tidskrift, Stockholm	Q	Stat. Tid.
Vierteljahrschrift für Staats-und Volkswirtschaft, Leipzig	Q	Vier. Staats. Volks.
Zeitschrift für die Gesamte Staatswissenschaft, Tübingen	Q	Zeit. Staatswissen.
Zeitschrift für Oesterreichischen Ingenieur-und Architekten-Vereines, Vienna	W	Zeit. Ing.-Arch.-Ver.
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Zeitschrift für Socialwissenschaft, Berlin	M	Zeit. Socialwissen.
Zeitschrift für Versicherungs-Recht und Wissenschaften, Strassburg	Q	Zeit. Ver. Recht. Wissen.
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INDEX FOR THE QUARTER, JUNE—SEPTEMBER, 1900.

(NOTE.—The following subject index is intended to continue the work began in the first (March, 1897) issue of MUNICIPAL AFFAIRS, which was entirely devoted to a Bibliography of Municipal Administration and City Conditions. In subsequent numbers, the Index was made complete to June 1st. So far as possible all books, reports, pamphlets and magazine articles of interest to students of city government which have appeared during the past three months, June to September, 1900, are included in the following list. Future numbers of MUNICIPAL AFFAIRS will contain similar indices covering the literature of each preceding quarter.)

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BIOGRAPHICAL NOTICES

OF THE

WRITERS IN MUNICIPAL AFFAIRS FOR SEPTEMBER, 1900.

PERCY W. L. ASHLEY.—Formerly scholar of Lincoln College, Oxford; Russell research student of the London School of Economics, 1898–1900; and now lecturer there.

M. N. BAKER.—Born in Enosburgh, Vermont. Took civil engineering course in the University of Vermont and graduated in 1886. Has been associate editor of "Engineering News" (New York) and editor of *The Manual of American Water Works* since 1887. Has written several books on sewerage and sewage purification, the section on *Water-Works* for "Municipal Monopolies," the articles on *Municipal Engineering* for the "International Year Book," and many papers on municipal engineering, economics and government. Has been connected with the local government of Montclair, N. J., for a number of years. Is chairman of the executive council of the New Jersey Sanitary Association, of several committees on uniform municipal accounts and reports, and practices as consulting municipal engineer.

JAMES R. CARRET.—Born February 16, 1845, near Trinidad, Cuba, of American parents, his father being in business there. In the spring of 1850 returned to the United States, and has since lived in or near Boston. Was graduated from Harvard University in 1867; then studied law and was admitted to the bar in 1871. From 1873 to 1879 was one of the assistant city solicitors of Boston, having charge of the work of examining titles in connection with land damage claims against the city and the purchase of lands for public purposes. Since leaving the employ of the city, has been chiefly engaged in conveyancing. In 1894 was appointed by Governor Russell as a member of the commission to draft a bill for the introduction into Massachusetts of the Torrens system of land transfer.

JAMES BLAKE CAHOON.—Was graduated from the United States Naval Academy in 1879, and served in the Navy until 1889, when he retired owing to a serious injury to his eye sight while conducting searchlight experiments. Until 1895 was connected with the Thomson-Houston Electric Company and the General Electric Company into which the former was merged. For four years was general manager of the electric-light, gas, water and street railway companies of Elmira, which were, under his management, completely reorganized and made paying properties. At present is a consulting engineer and vice-president of the Oneida Light and Power Company. Has recently been elected president of the National Electric Light Association.

MILO ROY MALTBIE.—Born near Hinckley, Illinois. Received his early education in the public schools and the preparatory department of Upper Iowa University, graduating from the College in 1892. Spent one year in the graduate school of the Northwestern University, devoting particular attention to municipal government. Was awarded, in 1893, the Dewey prize of $100 in Political and Social Science, and the Cushing prize of $100 in Municipal Government for a dissertation upon *The City*

Government of Chicago. From 1893 to 1895 taught higher mathematics and economics in Mount Morris College, Illinois, leaving there to accept the university fellowship in administrative law at Columbia University. Received the degree of Ph. D. from the latter institution in 1897, having given particular attention to administrative law, public law, economics and municipal government. After graduation, was chosen secretary of the Reform Club Committee on Municipal Administration and editor of MUNICIPAL AFFAIRS. Spent the summer of 1899 studying municipal problems and conditions in Europe. Prize lecturer upon municipal government in Columbia University, 1900. Has written *English Local Government of To-day; Central Administrative Control in England; The English Local Government Board; Municipal Functions; A Study of the Development, Scope and Tendency of Municipal Socialism;* and several papers upon other municipal subjects appearing in various magazines.

EDMUND JANES JAMES.—Was born May 21, 1855, in Jacksonville, Illinois. Educated at the Illinois State Normal School, Northwestern and Harvard universities, receiving the degree of doctor of philosophy from the University of Halle in 1877. Was professor of public finance and administration at the University of Pennsylvania from 1883 to 1896, accepting a call to the University of Chicago in February of that year. Has been president of the American Academy of Political and Social Science since 1889, and is a member of many prominent associations in the United States and Europe.

RICCARDO BACHI.—Born in Turin, Italy, 1875. Attended the Technical Institute of Turin and in 1896 the Royal High School of Commerce of Venice, receiving the degree of professor of accountancy in 1896. The following year became fellow of the *Laboratorio di Economia Politica* of Turin under the direction of Professor S. Coquetti de Martiis. Was appointed in 1896 professor of accountancy in the Royal Technical School of Arcevia and later in the Municipal Technical Institute and the Royal Technical School of Vicenza. Has written several pamphlets upon accountancy and municipal subjects, contributing to "Reforma Sociale," "Revista de Legislacion y Jurisprudencia," "Ragioniere" and "Rivista di Amministrazione e Constabilita."

JOHN ARCHIBALD FAIRLIE.—Born in Glasgow, Scotland, 1872. Attended public schools in Scotland and Jacksonville, Florida. Entered Harvard College in 1891, and received the degree of A. B. in 1895. Had specialized during his undergraduate course in history, government and economics, and continued these subjects in the graduate school of Harvard University for two years. In 1896, received the degree of A. M., and during 1896-7, was assistant in English History at Harvard. Was university fellow in political science at Columbia University in 1897-8, and received the degree of Ph. D. from that institution in 1898. Has since been secretary of committee on canals of New York State, 1899; lecturer on Municipal Administration, Columbia University, 1899–1900; and assistant professor of Administrative Law, Michigan University, 1900. Has published: *The Economic Effects of Ship Canals; The Centralisation of Administration in New York State; Comparative Municipal Statistics,* Quarterly Journal of Economics, February, 1900; Statistical tables and data relating to the canals and commerce of New York in Report of Committee on Canals; *The New York Canal,* Q. J. E. February, 1900; *State Administration in New York,* P. S. Q., March, 1900; *Municipal Development in the United States* in a Municipal Program.

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